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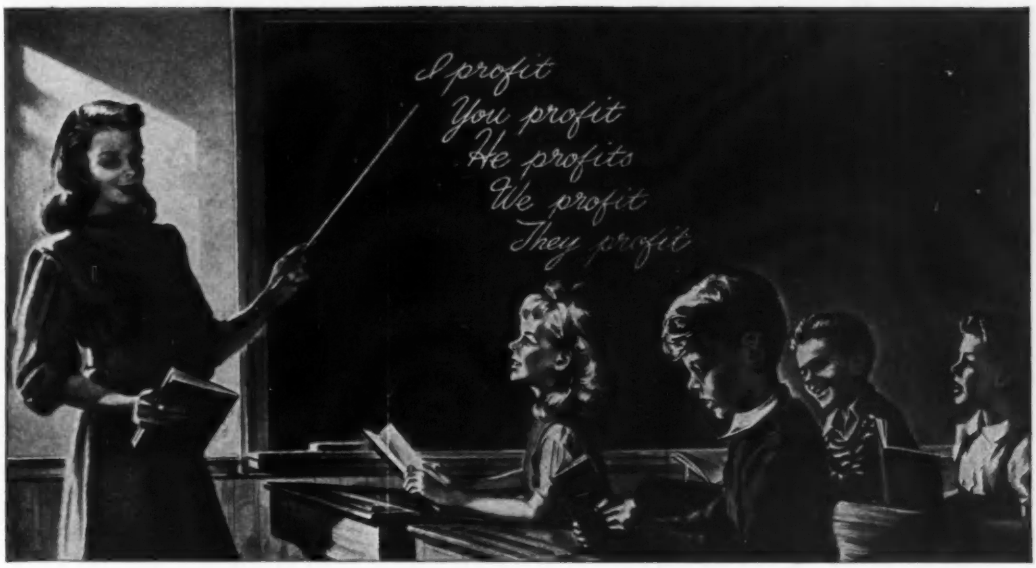
Paper TRADE JOURNAL

REG. U. S. PAT. OFF.

VOLUME 124, No. 16 APRIL 17, 1947

Let's conjugate in chorus—



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Profit is not earned alone. It is achieved by cooperation and is shared by all who participate in making or serving.

This is a truth that marches with man out of the ages into his ultimate future. It is as true for the doctor, the lawyer, the farmer, the engineer as for the enterprises of industry and commerce. The doctor increases the span of healthy life with profit both to himself and his patient.

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For the engineer, this sharing of profit or gains is a far-spreading service. It flows from his studies and surveys, through his plans, across his drawing board into the structures where men work in safety, live in comfort, learn, progress and so make more profit until the chain of gain comes back to you.

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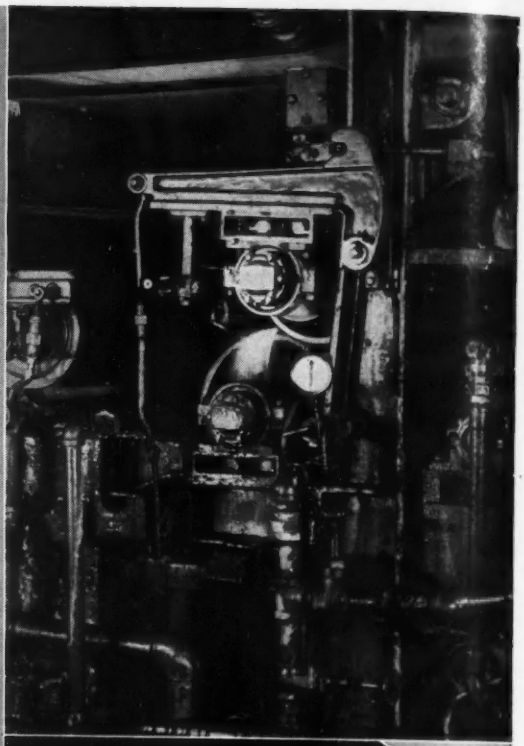

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Paper Making Machinery

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CALENDAR OF COMING EVENTS

May 18-21, 1947—National Paper Box Association, Annual Convention, Hotel Traymore, Atlantic City, N. J.

May 22-24, 1947—American Pulp and Paper Mill Superintendents Association, Annual Convention, Edgewater Beach Hotel, Chicago.

October 27-29, 1947—The National Paper Trade Association of the U. S., Inc., Semi-annual Convention, Hotel Sherman, Chicago.

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R.T. VANDERBILT CO. INC. · VANESTA · AMERICAN PRODUCTS

Stops Gelling

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Paper TRADE JOURNAL
REG. U. S. PAT. OFF.
VOL. 124, NO. 16 APRIL 17, 1947

Newsprint Output Up 9.8 Per Cent in March

NEW YORK—Production in Canada during March, 1947, amounted to 372,482 tons and shipments to 373,769 tons, according to the News Print Service Bureau. Production in the United States was 67,916 tons and shipments were 68,872 tons. The output in Newfoundland was 31,943 tons and shipments were 23,349 tons making a total North American production of 472,341 tons and shipments of 465,990 tons. Total production in March, 1946, was 430,608 tons and shipments were 411,726 tons. North American production in March, 1947 exceeded that of any March on record.

The Canadian mills produced 112,827 tons more in the first three months of 1947 than in the first three months of 1946, which was an increase of 11.6 percent. The output in the United States was 5,665 tons or 2.9 percent more than in the first three months of 1946; in Newfoundland production was 4,480 tons or 5.0 percent more, making a total North American increase of 122,972 tons, or 9.8 percent more than in the first three months of 1946, and also was higher than in any preceding similar period.

Stocks of news print paper at the end of March were 133,381 tons at Canadian mills, 10,980 tons at United States mills, and 84,635 tons at Newfoundland mills, making a combined total of 228,996 tons compared with 222,645 tons on February 28, 1947, and 208,776 tons at the end of March, 1946.

Woodin Joins W. C. Hamilton & Sons

MIQUON, PA.—C. F. Woodin has joined the sales staff of W. C. Hamilton & Sons and ill represent them in New England and New York State. Mr. Woodin was formerly with the Fraser Paper Company and the Rising Paper Company.

NPTA To Meet September 29

NEW YORK—The semi-annual convention of the National Paper Trade Association will be held in Chicago, October 27-29, with headquarters at the Hotel Sherman.

Shipping Container Problems Challenge Industry Attention

Paper Output Exceeds All Previous Records

NEW YORK — During the first quarter of 1947 the United States paper and paperboard industry, breaking all previous records, produced in three months more paper and paperboard than any other country has ever produced in a year. E. W. Tinker, executive secretary, American Paper and Pulp Association, stated this week that the quarterly production was 5,176,832 tons, which is almost a million tons greater than the total 1946 production of Canada, the next largest producer. The ratio of United States paper production to mill capacity for the week ending April 5, 1947, as reported by the American Paper and Pulp Association was 105.2 percent compared with a revised figure of 107.8 percent for the preceding week and 104.1 percent for the corresponding week a year ago. This does not include mills producing newsprint exclusively. Paperboard production was 102 percent for the current week compared with 102 percent for the preceding week and 99 percent for the corresponding week a year ago.

C. Y. ROBSON
who has laid aside other duties to give full time to his post as resident manager for Bloedel, Stewart & Welch, Ltd., at Port Alberin, B. C.

PHILADELPHIA—Proposals advanced by railroads to reduce loss from damage claims due to inadequate boxing are "fundamentally wrong," W. B. Lincoln, Jr., technical manager, Inland Container Corporation, Indianapolis, Ind., declared here last week.

Speaking at the sixteenth annual packaging conference and exposition at Convention Hall, sponsored by the American Management Association, Mr. Lincoln stressed that the increased costs involved in the railroad's suggestions "reach fantastic figures and are out of all proportions to losses experienced." In addition, he said, "The proposed changes would result in further restricting output of shipping containers and create a serious bottleneck in our production economy."

The pressure being applied by the Association of American Railroads to revise Rule 41 covering fiberboard containers, he pointed out, stems the fact that loss and damage claims paid out by the carriers have skyrocketed from $21,000,000 in 1940, to $79,000,000 in 1945. But Mr. Lincoln insisted, the railroads have not proven that boxes complying with the current rule have contributed excessively to their loss.

In fact, he added, the suggested changes, instead of improving the current situation, "would very likely lead to an increase in claims rather than a reduction."

Mr. Lincoln emphasized that shippers often get a false sense of security because, according to the railroads themselves, 95 percent of all claims are filed by the consignees. As a result, he said, some shippers believe they are overpacking and, to reduce costs, some may change to containers of lower strength when, if all the facts were known, the opposite action was demanded.

"This situation," he concluded, "should be corrected by setting up claim procedures which would assure full information regarding all claims reaching the shipper in each and every instance. This, in my opinion, is a job for the railroads to do instead of leaving it up to the consignee as they have heretofore."

L. A. Holder, packaging committee coordinator, Timken Roller Bearing Company, Canton, Ohio, reported on

(Continued on page 30)

Fred D. Clark Retires After 20 Years at Ansco

BINGHAMTON, N. Y. — Fred D. Clarke, formerly head of the paper finishing department of Ansco who has rounded out twenty years of service, has retired. Mr. Clarke, who is 65, joined Ansco in 1927. He was employed by the American Photo Products Company of Verona, N. J., when that company was purchased by Ansco.

When he came to Binghamton, Mr. Clarke brought with him a special machine he had designed for the Verona concern. It was on this machine that the first X-ray film was produced at Ansco in 1928.

The machine, which was built for film coating purposes, played a prominent part in Mr. Clarke's career. After installing the equipment in Verona, he remained with the concern to direct operation of the machine.

At Ansco he stayed with the machine after it had served its purpose in the X-ray manufacturing end. It was redesigned for paper coating work and Mr. Clarke transferred to the paper plant. Several years later, he became manager of the paper finishing department and remained in that capacity until his retirement.

Earl Murray Retires, Was Northern Mills Chairman

GREEN BAY, Wis. — Earl Murray, chairman of the board of the Northern Paper Mills, announced his retirement last week. H had been on the board of directors since 1907, six years after the firm's founding; had served as vice-president, and for two years as president, following the death of W. P. Wagner. Since then he had been chairman of the board.

Milan Boex, general sales manager and assistant to the general manager, succeeds Mr. Murray on the board, but no successor has been named as chairman, according to A. B. Hansen, president and general manager.

Strathmore Expands Duties Of Robert B. Clark

SPRINGFIELD, Mass. — Robert B. Clark, Jr., has been appointed head of the recently combined advertising, sales promotion and public relations departments at the Strathmore Paper Company. Clark, who has been advertising manager of Strathmore and the Old Colony Envelope Company of Westfield, since his release from the army early in 1946, has also represented the paper company in field sales in New England. He has been a member of the Strathmore organization in sales and advertising work since 1929.

During the war, Clark advanced to the rank of lieutenant-colonel. He first handled publicity and special events work in the Public Relations Office of the Office of the Chief of Ordnance, and later, as Chief of the Awards Branch of the War Department Bureau of Public Relations, he had charge of all Army-Navy "E" Award publicity and ceremonies.

He was presented the Legion of Merit by the Under Secretary of War for his services.

ROBERT LAIRD

Newly named general sales manager for Bloedel, Stewart & Welch, Ltd.

Marathon Choral Club Elects Don Hess

MENASHA, Wis.—Don Hess has been named president of the Marathon Choral Club. Plans were discussed at a special meeting last week for several local appearances of the club, including a spring concert early in May. Walter Strong, Marathon employe service manager, offered suggestions for increasing the club membership. The group was organized last December.

Canadian Wage Rates Hiked by 14 Cents

MONTREAL—A general wage increase of 14 cents an hour has been granted workers in newsprint, pulp and paper mills of ten companies. The agreement covers 18 mills operated by the Abitibi Power & Paper Company, the Beaver Company, the Brompton Pulp & Paper Company, Ltd., the Great Lakes Paper Company, the Kalamazoo Vegetable Parchment Company, Marathon Paper Mills of Canada, Ltd., the Ontario Paper Company, Ltd., the Ontario & Minnesota Paper Company, Provincial Paper Company, and the Spruce Falls Power & Paper Company.

The announcement came at the conclusion of a five-day conference of representatives of the companies and nine American Federation of Labor unions. A statement issued on behalf of management said that "the results of this conference demonstrated the good relations existing between management and labor in the industry."

B. C. Makes Progress In Its Reforestation

VANCOUVER, B. C.—British Columbia's projected program, for the production and planting of twenty million seedlings annually, moved appreciably nearer to accomplishment during the year just passed.

One of the major items of progress was the first sowing which took place on the Duncan nursery (Duncan, Vancouver Island) in the spring of 1946. The Duncan nursery is the third such unit to be established. The two nurseries already producing are located at Green Timber Forestry Station (on the mainland, located on the Trans-Canada Highway a few miles east of New Westminster) and at Campbell River on Vancouver Island.

The present schedule calls for an annual production at these three points as follows: Green Timbers nursery, eight million seedlings; Campbell River and Duncan nurseries each six million seedlings.

As might be expected, the "catch" at the new nursery, ie., the percentage of germination and seedling survival was disappointing. This is not an unusual occurrence on a newly developed site as the prevalence of weeds seriously militates against the successful establishment of the young trees. In 1946 this customary situation was further aggravated by excessive rains during the early summer. The actual survival percentage was fifty.

Robins' Von Thaden Sails To Visit Europe

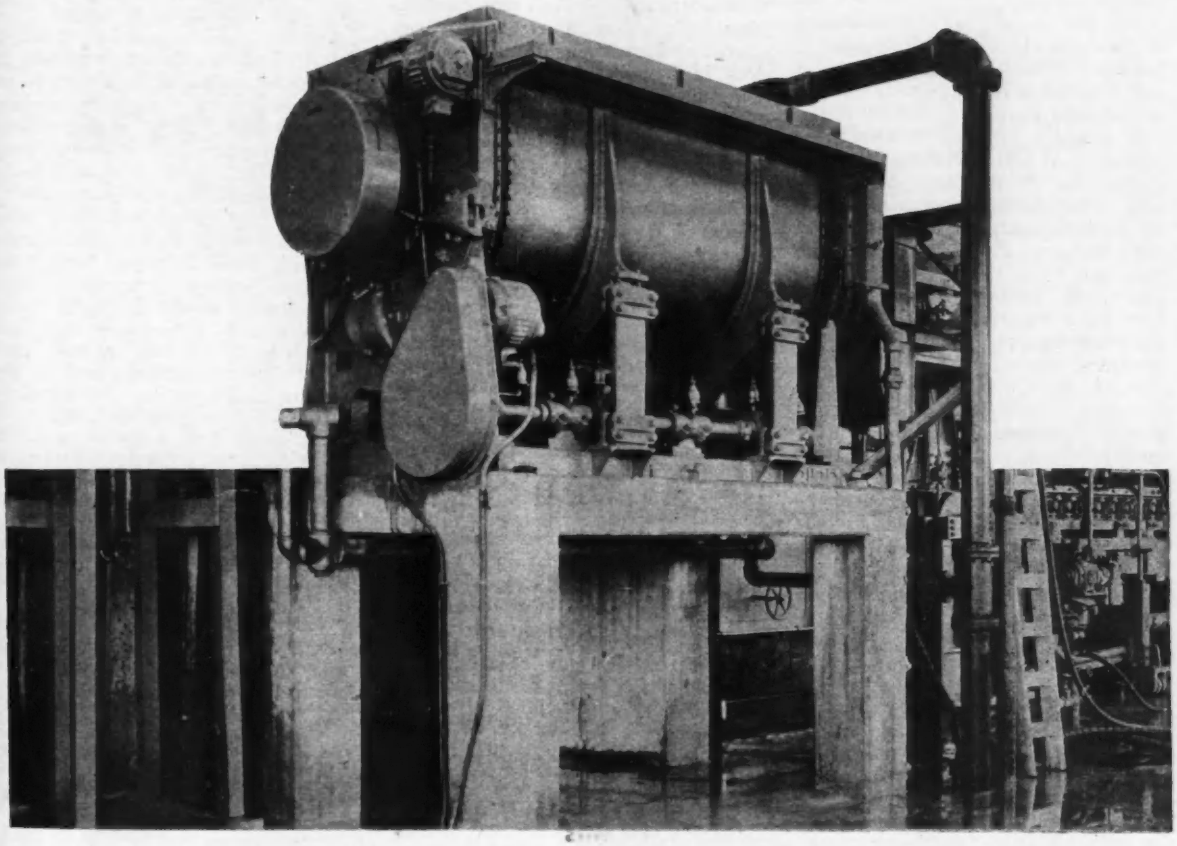
Harold VonThaden, vice-president of the Robins Conveyors Division and a director of the parent company, Hewitt-Robins Incorporated, sailed Wednesday aboard the Queen Elizabeth on a business trip abroad. He will first visit the British General Electric Company, parent organization of the Frasier & Chalmers Engineering Works, British manufacturers for Robins Conveyors. Then he will continue on to the Continent to transact other business and engineering matters for the company.

Shortly after his recent return from a business trip to South Africa, Mr. VonThaden was notified of his election to membership in the Chemical, Metallurgical & Mining Society of South Africa, with headquarters in Johannesburg. He also has been elected to the Finance Committee of the New York Engineering Society.

Mr. VonThaden expects that his trip to England and Europe will occupy some fourteen weeks.

Big BIRD SCREENS Stand Out

Ahead Of Almost Every Paper Machine On This Continent



why?

Because they help make better paper and more of it per day at lowest screening cost per ton

BIRD MACHINE COMPANY

SOUTH WALPOLE • MASSACHUSETTS

Capehart Bill Would Set Up Committee

WASHINGTON — Voluntary transfer of newsprint supplies between publishers, and establishment of a newsprint industry committee to facilitate such transfers during the present shortage, is provided for in a bill introduced in the Senate April 9, by Senator Capehart, chairman of the committee which has been investigating the newsprint supply.

The bill, S. 1080, was introduced by Senator Capehart on behalf also of Senators Wherry, Martin and Cain, and referred to the Committee on Interstate and Foreign Commerce.

It provides for establishment of a committee of nine, including three representatives of the American Newspaper Publishers' Association, two of the National Editorial Association, one from National Paper Trade Association, two from United States Newsprint Mills, and to be designated by National Publishers' Association. Chairman of the committee is to be appointed jointly by the Attorney General of the United States, and the Chairman of the Federal Trade Commission from among the above membership.

All members serve without Federal compensation, and meet on call of the chairman. The bill would exclude from operation of the anti-trust laws, the activities of this group, for one year following date of enactment of the bill.

A wide range of duties is laid on the committee, but the keystone of their job will be to facilitate the supply of newsprint. Upon certification by the chairman, the committee would be empowered to transmit to any manufacturer or distributor or user of newsprint, a request for voluntary release of the amount of newsprint approved for the applicant in question.

In short, the bill provides for a form of voluntary distribution of any excess newsprint holdings, for the benefit of any approved applicant who is short. Provision for compensation is covered also in the bill.

The new Congress has followed a practice of ordering quick hearings on such legislation, and speedy passage, and it is assumed this will be the course of the present legislation, with possible amendment in committee.

Court Reverses Ruling Affecting Fort Howard

MADISON, Wis. — The Wisconsin State Supreme Court last week reversed a decision by the late Circuit Judge Henry Graass of Green Bay in which the latter had held that the Fort Howard Paper Company, Green Bay, could be excluded from a sanitary district set up by the town of Ashwaubenon.

The Supreme Court held that although the Fort Howard company had constructed a disposal works of its own and would have no immediate use for the sanitary district, it would have a benefit accruing to its property through creation of the district.

Stationery Store Sales Rose 21 Per Cent in February

WASHINGTON — Although combination book and stationery stores, book stores, and stationery stores all showed loss in business in February or no gains from January figures, they showed marked gains over February a year ago, and for January and February of last year, according to the latest figures of the Department of Commerce.

Based on reporting groups of stores, combined book and stationery stores showed February sales of $5,256,999 for 270 stores; this was five percent under January sales for the group. Sales for January and February were 19 percent above those for the same months last year, while February sales were 21 percent better than February 1946 figures.

A group of 116 stationery stores had a February business of $1,267,281, eight percent less than in January, but 18 percent above February, 1946, while January-February sales were 22 percent above the corresponding 1946 months.

St Regis Enlarges Board; Elects Two Vice-Presidents

NEW YORK—Election of William H. Versfelt and Edward G. Murray as vice-presidents of the St. Regis Paper Company was made known this week by Roy K. Ferguson, president. Mr. Ferguson also reported the election of two new directors, Ashley D. Pace and Gurdon W. Wattles, increasing the board to 19 members.

Mr. Versfelt is treasurer of both the St. Regis Paper Company and its sales subsidiary, the St. Regis Sales Corporation. Mr. Murray, executive vice-president of the sales corporation, directs the sales of printing, publication and converting papers. Mr. Pace is a vice-president and director of Florida Pulp & Paper Company and Alabama Pulp & Paper Company. Mr. Wattles was formerly associated with White, Weld & Company, where he was a partner for ten years.

Julian Richmond

YONKERS, N. Y.,—"Julian Richmond, formerly president of Potdevin Machine Company, Brooklyn, N. Y., and Chairman of the Board since 1942, died on April 12 at the Yonkers General Hospital. Mr. Richmond joined Potdevin company shortly before the first World War and had long been active in the paper converting industry."

FTC Reports On Publisher Policies

WASHINGTON — Mergers of smaller corporations with larger concerns in competing fields, are hit by Federal Trade Commission in the report on which the President has asked for amendment to the present anti-trust laws, closing a loophole which the Commission blames for much of this activity the past year.

The report deals briefly with the newsprint and paper industries.

"In the publishing field," it stated, "most of the acquisitions represent an attempt by magazine publishers to assure their source of paper by purchase of paper mills. This follows the lead established years ago by the big newspaper chains which integrated backward by purchasing newsprint mills.

"Time, Inc., purchased three paper mills recently. It later re-sold them to St. Regis Paper Company, but entered into long-term contracts with St. Regis for magazine paper. St. Regis Paper, in addition to taking over the paper mills from Time, Inc., recently purchased several firms located in the southern Kraft region, thus broadening its activities geographically.

"St. Regis also acquired a rayon manufacturer, thereby affording a ready outlet for its woodpulp. International Paper Company, the leading paper company on the North American continent, has taken over companies manufacturing paper containers from paperboard formerly purchased from International."

The Commission cited these activities as showing that in the case of paper, the dominant form of acquisitions has been the extension of operations into allied fields such as kraft paper and paperboard.

However, the National Geographic Society was named as having purchased a paper mill; also, said the Commission report, McGraw-Hill Publishing Company has bought up other magazine publishers.

The report has been the basis of much speculation here as to possible prosecution by the Attorney General, but the general interpretation of the situation appears to be that until Congress amends the law, no positive steps can be expected to succeed, and hence most of the reports are speculative, as to the various industries mentioned.

Byron Weston Contracts for New Finishing Building

DALTON, Mass.—The Byron Weston Company has awarded the contract for its new paper finishing building to George E. Emerson of Pittsfield. The two-story building will have 24,000 square feet of floor space and will feature continuous bands of glass blocks, quartzite concrete floors and special air conditioning and lighting to aid in finishing the paper.

YES, the use of BECCO HYDROGEN PEROXIDE has increased in the Paper and Pulp Industry

INDICATIVE of the increase in the use of Becco Hydrogen Peroxide, is the fact that we have increased the number of our tank cars by more than 1300 per cent from 1931 to 1947!

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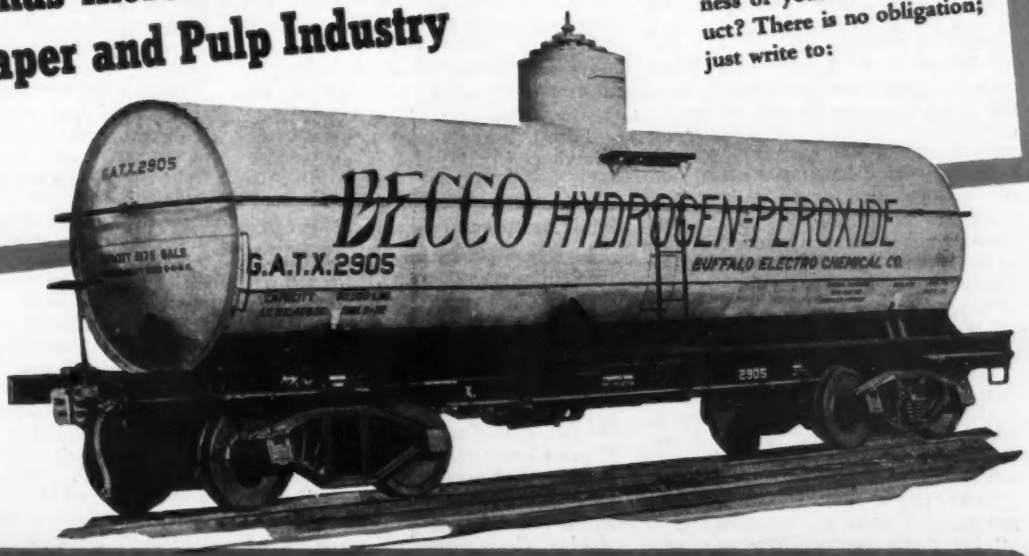
As a result of many years of this research, Becco's engineers and chemists are qualified to give valuable advice and data on groundwood pulp bleaching. Why not ask them how you can improve the brightness of your finished product? There is no obligation; just write to:



BECCO SALES CORPORATION

AGENTS FOR BUFFALO ELECTRO-CHEMICAL COMPANY, INC.

BUFFALO 7, NEW YORK

New York Boston Philadelphia Chicago Charlotte

Paper Buyers Scan Price Movements

NEW YORK—Reference to conditions in the paper market prepared for the National Association of Purchasing Agents by its Paper Committee this week generally added another factor to the survey of conditions. Accustomed to a summary review of facts about each major classification of the paper industry, prepared by a man in close touch with that specialty, the purchasing agents this week found their bulletin also reflecting the views of the large buyer on higher prices as quoted.

Says T. A. Corcoran, of the Louisville Courier-Journal, chairman of the committee:

"Practically every section of this month's report mentions price increases, and several question whether the increases are necessary. Profit reports certainly indicate that some of them are not. It requires real business statesmanship to pass up price increases at a time like this, when demand continues to exceed supply. But, any manufacturer who has the foresight and courage to do it, should gain enough good will to pay him a long-time dividend far in excess of the temporary financial gain he foregoes now."

To this echoes E. E. McCulley, of the same organization, speaking for fine papers, since his interest is in job printing:

"It seems that the paper industry is being ranked along toward the top of that list showing the greatest percentage of earnings increase. Many of its friends hope that it hasn't overdone it. Those of us who believe in the American way of free enterprise, or whatever we may call such a conception, should lean over backwards to keep from handicapping our horse out of the race."

Stuart Edgerton, of the United States Rubber Company, adds his voice to the report. Speaking for kraft paper and boxboard buyers, he finds:

"There are occasional lots of paper offered, but usually in weights that are not widely used and at prices that are considerably out of line with the current market. The outlook is not a healthy one, and the time is not far off when buyers are going to have to say "no" to price increases which have no sound basis.

"The paper industry is repeating again what history shows has gone on for many years. There are some exceptions, but the industry as a whole seems to be trying to establish a good basis for labor to work for additional increases.

"There is not very much difference between the kraft paper situation and the boxboard situation. Some of the prices that boxboard manufacturers are quoting at the present time are beyond all reason.

"True, the demand is much larger than the supply, but board manufacturers who are increasing prices considerably higher than required by the increases of their raw materials, are leaving themselves open to a reaction which is not going to be very pleasant. That reaction is due sooner or later. It is bound to come, and the higher and the faster they go up, the quicker and the farther they will fall.

"U. S. Department of Commerce report on pulp and paper for March discloses increases in production and consumption of kraft paper and boxboard for January, 1947, over January, 1946. It also shows wholesale prices in which paper shows a moderate increase, but paperboard is up 43.8% for January, 1947, over January, 1946.

"What possible basis can the paperboard industry show for such an increase in price? Certainly the hourly earnings for labor do not indicate such an increase being necessary. The situation is not only critical, but dangerous, and purchasing men should protest the high prices being asked for this commodity."

AFPI Offers Mat Book

WASHINGTON, D. C.—Containing nineteen new mat features of tree-growing and forest-protection subjects, the American Forest Products Industries' eighth advertising proof book is now being distributed. The new publication illustrates four editorial mats, a feature offered this year for the first time, as well as fifteen new advertising layouts and eight selected reprints from previous editions. It is being mailed to publishers, advertisers and forestry agencies in all 48 states as an aid to the preparation of special forestry and forest products editions of newspapers, trade publications and house organs.

Forest ownership, national tree-growing acreage, forest employment and production, and wood utilization are included in the editorial material while fire prevention and tree-growing are the subjects of the advertising proofs.

Union Bag Adds Two To Its Directorate

NEW YORK—Kenneth J. Hanau and Robert W. Groves have been elected to the board of directors of Union Bag & Paper Corporation. Mr. Hanau is executive vice-president, treasurer and general manager, director and member of the executive committee of Wagner Baking Corporation, Newark, N. J. He is a director of the Missouri, Kansas & Texas Railroad Company, National State Bank of Newark, and Tri-Continental Corporation.

Mr. Groves is senior partner of Strachan Shipping Company, Savannah, Ga., and chairman of the board of the Savannah Bank & Trust Company, president of the Savannah Port Authority, and president of the Industrial Committee of Savannah, Inc.

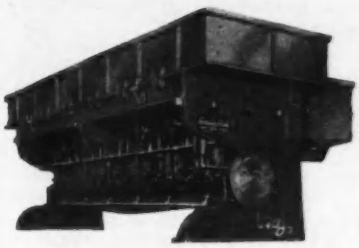
SAPEYES Evaluate Customer Relations

CHICAGO — The western division of the Salesmens Association of the Paper Industry has embarked upon a series of programs designed to illustrate what the paper salesman can do to further his position and the position of his industry during a time when little actual selling is possible. The first of a series of at least three meetings was held at the Hotel Sherman on Monday noon, April 7, when Norman Altman, executive vice-president of the Butler Paper Corporation, discussed the potentialities of sales effort even during the period when the market is in an oversold condition. Speaking from the viewpoint of the jobber, Altman is reported to have pointed out that the salesman can be of tremendous help in advising his customers as to when conditions are likely to change, to aid in shipping problems, to follow through on delays and, in general, to give service to customers plagued by the shortages. Altman also is said to have indicated that the salesman can be of great assistance in giving advice as to new lines, possible substitutes when desired grades are not available and, in general, to provide the explanations so necessary to keep the customer trade friendly and cognizant of what is going on at all times. Altman was introduced by Courtney Reeves of the Allied Paper Mills. The session was closed to guests to permit a frank discussion of all sides of the problem.

During the meeting, business conditions were also reportedly discussed with the consensus of opinion that newsprint would continue extremely tight for a considerable time; that the mills are sold out on sulphite papers until next year or at least until far into the fourth quarter of this year; but that rag papers were giving indications of being not quite so difficult to supply.

The second in the series of meetings held April 14, had the converter trade represented by guest speaker H. K. Snyder, president of the Central Waxed Paper Company of Chicago. It is reported that this meeting was also a closed session as far as guests were concerned. A final session giving a presentation of the salesmen's position in an oversold market, is reportedly scheduled for April 21 when a representative of the manufacturers will be present. With the jobber views presented by Altman, the converter slant on the matter developed by Snyder and the third session from the manufacturers' angle, the western division of the SAPEYES believe they are going to get invaluable information which should go a long way toward continuing good will and excellent customer relationship in the paper trade in this area.

Sandy Hill Packer Super Screen for LARGE Volumes of CLEAN Stock



Now available . . . ALL-METAL CONSTRUCTION

Illustrated above is the Sandy Hill Roller-Shoe Packer Screen with the new all-metal vat and flow box. Built of smooth, non-corrosive metal, these units are simple in design, light in weight, but exceptionally sturdy and capable of serving satisfactorily for many years without attention or replacement. Units are interchangeable, so that existing Packer Screens can be easily modernized by replacing wooden parts with the new all-metal units.

6,000 Packer Screens in the country's best equipped mills attest their wide acceptance and efficiency. New advances in design and performance now assure further increased efficiency, capacity and service life.

Fitting naturally into any mill set-up, the Sandy Hill Packer Super Screen can be depended on to pass a large volume of stock, removing dirt, knots, string and other foreign matter effectively, quickly and thoroughly, with a minimum of attention and mechanical complication.

Also grades fibers in pulp production and cards fiber bearing stock, in conjunction with fourdrinier or board machines, and may be operated as a centrifugal secondary, a round screen tailer or a centrifugal system tailer.

- **Fits production needs and plant layout.**
- **Continuous lubrication system.**
- **Reduced vibration.**
- **Fully accessible for cleaning.**
- **Anti-friction bearings on roller-shoe journals.**
- **Low maintenance.**

Write for new Bulletin

THE SANDY HILL IRON & BRASS WORKS
HUDSON FALLS, N. Y.

FINANCE

St. Regis Trebles Net In First Quarter

NEW YORK — Sales and earnings of the St. Regis Paper Company and subsidiaries for the first quarter this year set new records for the period, reflecting in large part the results of the company's long-range development and expansion program, Roy K. Ferguson, president, reported at the annual meeting late last week. Mr. Ferguson told stockholders that the Board would consider the resumption of common dividend payments in the third or fourth quarter this year.

For the first three months of 1947 net income after taxes amounted to $3,698,826, as compared with $1,004,656 for the corresponding 1946 period. The company reported a record total of $5,563,604 for all of 1946. On a per share basis, this year's first quarter earnings were equal to 67 cents a share on the common stock, compared with 22 cents in the comparable period of 1946.

Net sales in the initial quarter this year totaled $32,938,299, about doubling the volume of $16,584,149 reported a year earlier. For the first quarter of this year 42 percent more multiwall paper bags were manufactured than a year ago; tonnage of printing, publication and converting papers, kraft paper, and pulp produced showed an increase of 155 percent, while Panelyte tonnage rose 45 percent.

"The extensive development and expansion program, started about two years ago, and which involved the company's pulp, paper, bag and plastic production and converting facilities, is nearing completion," Mr. Ferguson informed stockholders.

"This program," he added, "has lifted total assets of the St. Regis Paper Company to $104,500,000, an increase of $34,000,000 in the past 12 months alone. The company's major acquisitions during this period included the purchase from Time, Inc., of the Hennepin Paper Co., of Little Falls, Minn.; Bryant Paper Co., Kalamazoo, Mich.; and Maine Seaboard Paper Co., Bucksport, Me.

"In addition, St. Regis acquired southern properties for the first time through the purchase of the Florida Pulp and Paper Company, Pensacola.

"The new 75,000-ton multiwall kraft mill and bag factory now under construction at Pensacola by Alabama Pulp and Paper Company in which St. Regis has an interest, is proceeding according to schedule."

Mr. Ferguson predicted that a "strong demand" for St. Regis products would continue throughout the remainder of the year, and estimated that total paper and paper board production in the United States for 1947 would approximate 21,500,000 tons.

Winnebago Ice Slows Traffic

APPLETON, Wis. — Only two tugs passed through the Appleton locks of the Fox river last week. Navigation opened Monday morning, April 7. The season has been hampered by the fact that there is still ice on Lake Winnebago.

Container Triples Net For First Quarter

CHICAGO—Shareholders of Container Corporation of America have been warned by Walter P. Paepcke, chairman, not to become over-optimistic about the remaining months of the year despite an increase in first-quarter net profit to $3,182,000 from $1,032,000 reported in the corresponding period of 1946.

Based on the 990,474 shares now outstanding, the first-quarter earnings would be equal to $3.21 a share, compared with $1.32 for the similar months last year when 781,253 were outstanding.

"Business is unusually good and prices satisfactory," he said, but "I cannot predict what will happen five minutes or five days from now." Business now is operating in an abnormal period of profits, he said.

He told the annual meeting in Chicago that "you can be sure competition is going to become strong." Container already has installed some new equipment to prepare for more competitive selling, he added, and plants will get faster and newer fabrication machines as soon as they can be obtained.

To provide additional funds for improvements, replacements and additional machinery, the stockholders authorized issuance of 100,000 new shares of $100 cumulative preferred. It is understood that this will be marketed in the near future at a probable dividend rate of 4 percent.

Stockholders also approved rescinding authorization of an issue of $5,000,000 of preferred authorized in 1941 but never issued, and voted to increase authorized common shares from 1,000,000 to 1,500,000.

FINANCIAL RECORD OF THE WEEK

New York Stock Exchange

High, Low and Last for Week Ending April 12, 1947

STOCKS

	High	Low	Last
A. P. W.	5¼	5	5
Armstrong Cork Co.	48½	45¾	45¾
Armstrong Cork Co. pf.	106	105	105⅞
Celotex Corp.	29	27⅛	27¼
Celotex Corp., pf.	20¾	20⅝	20⅝
Certain-Teed Products Corp.	17	15¾	15¾
Certain-Teed Products Corp., pf.	....	....	....
Champion Paper & Fibre Co.	22¾	22	22
Champion Paper & Fibre Co., pf.	110½	110	110½
Congoleum Nairn Co.	27	26	26
Container Corp. of America	43¾	42¼	42½
Crown Zellerbach Co.	28¾	27½	27¾
Crown Zellerbach Co., pf. 4.20	107¼	106½	106½
Crown Zellerbach Co., 4 pf. 4	116	114	116
Dixie Cup Co.	30	29	29
Dixie Cup Co. A.	54¾	53½	54
Flintkote Co.	31⅛	29⅛	29⅛
Flintkote Co., pf.	108½	108½	108½
Robert Gair	6¾	6¼	6½
Robert Gair, pf.	20	20	20
International Paper Co.	46⅞	44½	44½
International Paper Co., pf.	103½	103	103
Johns Manville Corp.	125	122½	122½
Johns Manville Corp., pf.	117½	117	117
Kimberly-Clark Corp.	24⅞	24	24⅞
Kimberly-Clark Corp., pf.	109¼	108	108
Mac Andrews & Forbes	37	37	37
Mac Andrews & Forbes, pf.	....	....	....
Marathon Corp.	25¼	23	23
Mead Corp.	21¾	20½	20¾
Mead Corp., pf. 4¼	103¾	103	103
Mead Corp., pf. 2	49½	48¾	49
National Container Corp.	38½	37	37
Paraffine Companies, Inc.	71¾	69⅞	70½
Paraffine Companies, Inc. pf.	....	....	....
Rayonier, Inc.	22½	21¾	22¼
Rayonier, Inc., pf.	37	36½	37
Ruberoid Co.	51	48½	49
Scott Paper Co.	44	42½	44
Scott Paper Co., pf.	99½	98½	99½
Sutherland Paper Co.	....	....	....
Union Bag & Paper Corp.	32⅞	31⅛	31⅜
United Paperboard Co.	16⅛	15	15
U. S. Gypsum Co.	99¾	96⅞	96⅞
U. S. Gypsum Co., pf.	195	195	195
West Virginia Pulp & Paper Co.	40¼	38⅞	38⅞
West Virginia Pulp & Paper Co., pf.	113	112½	113

BONDS

Abitibi Pulp & Paper Co., 5s '53	....	....	....
Celotex Corp., 3¾s, '60	....	....	....
Certain-Teed Products Corp., 5½s, '53	....	....	....
Champion Paper & Fibre Co., 3s, '65	103½	103¼	103½
Mead Corp., 3s, '66	....	....	....

New York Curb Exchange

High, Low and Last for Week Ending April 12, 1947

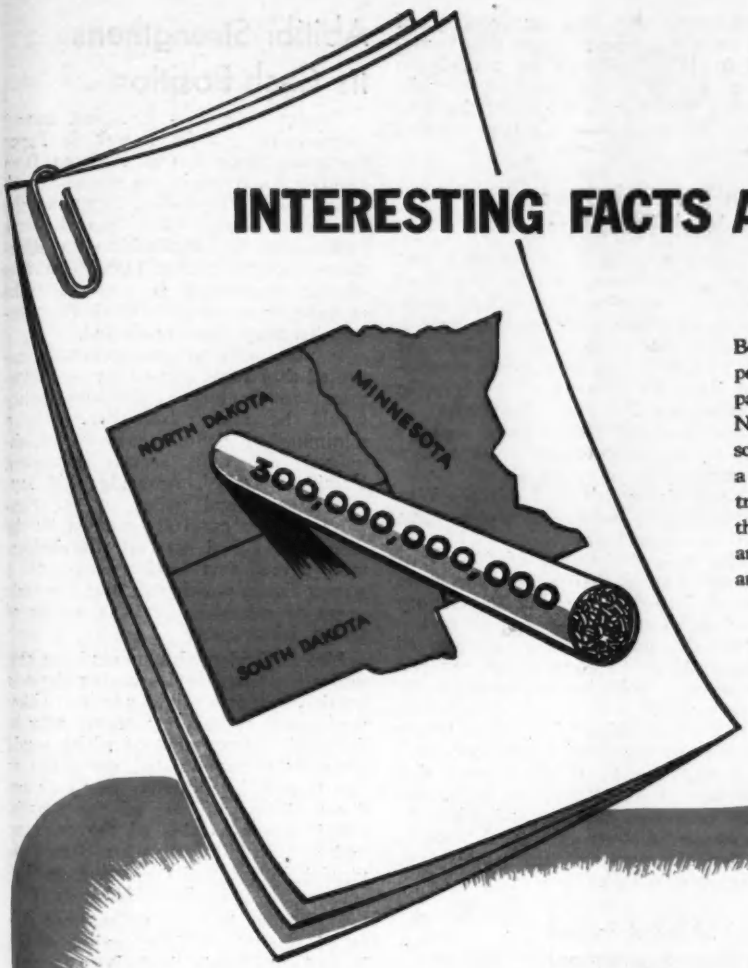
STOCKS

	High	Low	Last
Great Northern Paper Co.	42½	42	42
Hummel Ross Fibre Corp.	30½	29¾	29¾
St. Regis Paper Co.	9½	8¾	9⅛
Taggart Corp.	9	9	9

BONDS

American Writing Paper Co., 6s, '61	....	....	....

INTERESTING FACTS ABOUT PAPER



Before the war the United States was dependent on outside sources for cigarette paper, made entirely from linen rags. Now, seed flax, grown mostly in Minnesota and the Dakotas, is utilized to make a thin, strong, white paper for the country's 300 billion cigarettes, and most of those smoked in South America, Europe, and the Far East, as well as for books, and even national currency.

INTERESTING FACTS ABOUT ACID ORANGE Y

Acid Orange Y is one of the most extensively used acid colors. Its brilliant shade, excellent solubility, and economy make it suitable for all types of coloring—beater, calender, dipping, and coating.

It is suitable in the production of high grade paper as well as the cheaper groundwood papers. It is extensively used in the production of salmon, mandarin, tan and brown colors in poster, cover, boxboard, leatherboard, wrapping paper, and sheathing.

In the deeper shades, better retention is obtained by increasing the amount of size and alum.

Consult your Calco representative for more complete details.

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Parker Sees Peak Year For Kimberly-Clark

NEENAH, Wis. — Cola G. Parker, president of Kimberly-Clark Corporation, said Friday, April 11, at the annual stockholders' meeting that from present indications, 1947 should set an all-time high corporate record in production as well as in dollar sales.

Preliminary figures indicated first quarter sales of more than $20,500,000 with return, after taxes and provision for preferred stock dividends, in excess of $1.25 per share of common stock outstanding as compared with 49 cents on the same number of shares in the first quarter of 1946, Parker said.

The stockholders, with 96 percent represented, voted in favor of a director's resolution to eliminate preemptive rights in respect to common stock.

Directors were elected: H. B. Boon, C. B. Clark, W. H. Clifford, John H. Hancock, Walter Kasten, W. R. Kellett, John R. Kimberly, R. W. Lyons, Ernst Mahler, Cola G. Parker, Charles H. Sage, F. J. Sensenbrenner and S. F. Shattuck. The only change was the election of Mr. Lyons, assistant vice-president, in place of F. E. Sensenbrenner, who retired from active service on January 1, 1946.

At the subsequent directors' meeting, all officers were reelected: Parker, president; Mahler, executive vice-president; Sage, Kimberly, Boon and Clifford, vice-presidents; and J. F. Hunt, secretary-treasurer. Kellett, Lyons, C. F. Jenkins, R. M. Watt and C. W. Nelson were appointed assistant vice-presidents, and J. Leslie Sensenbrenner as assistant secretary-treasurer.

"Modest price increases were made last year to allow margins which were still below those maintained in previous periods considered to be normal," Parker said, "so that other factors must be considered, too, in the 1947 showing. Quite encouraging was improvement by our operating organization in obtaining better control over costs, and additional help now is beginning to come from expenditures in existing mills and the resultant increase in production. Also, the largest projects involved in our program are not yet scheduled to begin production and as they are completed they will contribute to future results. There is overall indication of the soundness of our programs."

Parker emphasized that corporate progress is important for employes and communities in which Kimberly-Clark operates, as well as for the stockholders. He said that employment in the corporation has increased nearly 25 percent since V-J Day. It has risen from a 1945 average of 6,244 persons to a current level approaching 8,200. This doesn't include affiliated companies nor that in woodland operations.

Hamersley Celebrates 70th Year

GARFIELD, N. J.—The Hamersley Manufacturing Company is this year celebrating the 70th anniversary of its founding. The company was founded in 1877 and exhibits records to prove it was the first company to make waxed paper and also later the first mill to make greaseproof paper in this country.

Plan Thorough Survey Fox-Wolf River Area

GREEN BAY, Wis.—A complete and thorough survey of the Fox and Wolf river area in Wisconsin will be made during the fiscal year starting July 1, for a possible flood control project, the chief of army engineers told Congressman John W. Byrnes, Green Bay, in Washington, D. C., on April 12.

The Fox and Wolf survey, authorized by the last Congress, could not be made last year because of inadequate funds but is included in the War Department's budget for the pending civil functions bill.

The engineers' pledge of the survey "should put at ease those who have feared it would be just a cursory checkup," Congressman Byrnes said.

"All possibilities for a solution of the problems arising from uneven water flow, pollution and erosion will be explored."

A representative of the civil works director in the War Department will visit the Fox-Wolf river area this summer, probably in June, to confer with interested persons and with the Milwaukee district engineers' office to outline the scope of the survey, the congressman said.

Burt Strike Averted By New Agreement

BUFFALO, N. Y.—An agreement between union and company officials at the F. N. Burt Company paper box plants here averted a threatened strike of some 1,500 employes. Company executive William C. Milson said that settlement terms were agreed upon shortly before a midnight walkout deadline set by Local 13249, District 50, United Mine Workers. Under the agreement, he said, employes will receive wage increases ranging from 8½ to 11 cents hourly, depending upon incentive and non-incentive rate classification.

Paper Men Learn Pipefitting

APPLETON, Wis. — Twenty-one men from four paper companies will conclude an introductory pipefitters' course April 17. The course, designed as a practice and introductory unit, will be followed next fall by other more specific units, including mechanics, hydraulics, and heat and temperature as applied to pipefitters.

The companies represented are Thilmany Pulp and Paper Company, Kaukauna; Fox River Paper Company, Appleton; Neenah and Kimberly mills of Kimberly-Clark Corporation; and Combined Locks Paper Company, Combined Locks.

Abitibi Strengthens Its Cash Position

TORONTO, Ont. — The first annual meeting of Abitibi Power & Paper Company since it was released from receivership brought an attendance of fewer than 30 persons, including the directors. Only 6,793 shares were represented by stockholders in attendance, though another 1,061,941 shares were represented by proxy. The meeting was routine and all the present directors were re-elected.

It was more or less generally expected that some sort of an announcement concerning a dividend policy would be made, but there was a minimum of definite information divulged on that score. However, President D. W. Ambridge did say:

"The dividend policy of the company will be carefully studied by the directors. I feel sure all shareholders will agree that maintenance of a strong liquid position during the early years of rehabilitation is a matter of prime importance."

Mr. Ambridge also pointed out that under the trust deed securing the new bond issue, no dividends on either perference or common shares may be declared, the payment of which would reduce the consolidated net assets to less than $12.5 millions. Nor may any dividend be paid out of the consolidated earned surplus of the company and its subsidiaries (other than Provincial Paper, Ltd.) existing on December 31, 1946, he added.

Mr. Ambridge also pointed out that as of April 1, 1947, refunding of the 5 percent bonds had been accomplished, and the company was now free to act without the restrictions imposed by the plan of reorganization. "Among other things, this means that the 14 shares of 5 percent preferred stock which were held by the seven Class A directors have become redeemable and all directors may not be elected by shareholders," he said.

Respecting the $6 a ton price increase effective April 1, 1947, Mr. Ambridge said, "We believe that the company's customers are entirely willing to assume whatever expense is necessary in order to maintain maximum production of a commodity which the whole world urgently requires."

Rodney Hunt Sheet Metal Rolls Are Light—Strong

ORANGE, MASS—The Rodney Hunt "Shaf-Tite" Roll as developed by the Roll Division of the Rodney Hunt Machine Company, has a rolled sheet metal body, with smooth soldered joints and internal disc heads with cast iron end hubs to provide strong shaft anchorage. It is said to be ideal for many dry service uses. Either idler or driven rolls are available in following diameters: 5, 6, 7, 8, 9, 10 inches and built in most any length.

Foresees Connecticut As Pulp Mill Site

NEW HAVEN—"Connecticut is going back to the forest," stated Dr. Robert S. Aries, director of the Northeastern Wood Utilization Council, at a recent meeting of the Council, "and a new pulp mill in the state is entirely within the realm of possibilities."

"Few people realize that more than 60 percent of the area is forested and there are a good two million acres of woodland in the state. Fewer still realize that at the very conservative yield of half a cord per acre annually, the Nutmeg state is capable of producing more than a million cords of hardwood each year. Some of it may be useable for construction and furniture, but the bulk is suitable for pulp manufacture," Dr. Aries declared.

"To realize the potentialities of this greatest natural resource of Connecticut, Connwood, Inc., was founded two years ago by a group of timberland owners interested in developing suitable methods for removing the thinnings and unsaleable wood for utilization by pulp industries. This group, headed by Edgar L. Heermance, who is now secretary of Connwood, Inc., hopes to improve the state's forest stands on a sustailed yield basis. In the words of Mr. Heermance, "Connecticut will be producing high grade lumber in a generation, as we are now able to "harvest" the crop and aid the landowner through stabilized marketing channels. Growing of timber is a paying proposition, something which few landowners realize."

The field director of Connwood is Michael M. Pochan, Jr., a forester who explains that "farms in Connecticut have been disappearing in the last century, changing the complexion from meadows to forests. Like Topsy, these forests grew, but many of the trees are crooked and of low value. By means of thinnings for wood pulp—the best and largest market—the forests of Connecticut may become as important as they were in the past.

"Among the other advantages of a pulp mill in Connecticut is the elimination of the freight of $6-$8 per ton of pulp from the South. Due to government wage floors and unionization, the 'cheap' Southern laborer has almost disappeared, thus erasing that advantage of other areas. In a highly mechanized pulp and paper mill, the cost of labor is not as important as in the past.

"A number of financial interests are now looking into the possibilities of Connecticut pulp mills, which will embody the latest advances in hardwood pulping and able to give high grade book, wrapping paper or chemical pulp for rayon and plastics," Dr. Aries concluded.

RICHARD W. BROWN

of Downingtown, Pa., who has just been selected by the faculty of the Institute of Paper Chemistry to receive the annual Paper and Twine Association award for 1947. Mr. Brown is a graduate of Haverford College in the class of 1942 where he completed his course with honor in chemistry and was elected to Phi Beta Kappa. Following this he carried on two years of research in analytical chemistry at the Rohm and Haas Company in Philadelphia from which point he entered the Navy where he served two years following a period of training in radar and attained the rank of Lieutenant (j. g.).

United Will Expand Lowman Operations

SYRACUSE, N. Y. — The United Paperboard Company which has purchased the entire interest of Lowman Folding Box Corporation, Syracuse, plans expensive expansions. Melle E. Lowman explained that the Lowman corporation becomes a wholly-owned subsidiary of United and he remains as general manager.

Lowman has 70,000 square feet of manufacturing space in several buildings on a plant size of nearly three acres. The concern has been doing about $1,500,000 business a year and has 160 employes.

Producing folding paperboard boxes, with printed and colored design, it has been serving customers in a wide range of the business twenty years ago, buying out the folding box department of Schmeer's Paper Box Company, and setting it up in another plant. In 1932 Lowman bought a like department of the J. F. Friedel Paper Box Company and in 1943 acquired the business of the Spencer Folding Box Company. The Spencer unit burned last year.

Plans call for present personnel to be retained and additions to the force probable. Lowman operates its own fleet of four transport trucks, has railroad siding dock space for three cars and services export trade as well as domestic.

Find Cotton Stalks Hold Possibilities

WASHINGTON—Woody fiber of waste cotton plants can be used to make a serviceable paper or to extend wood pulp supplies, according to a report now available from the Office of Technical Services, Department of Commerce.

Soda and sulphate methods of pulping give highest yields of pulp when applied to the lower stem and root, with the best grade of fiber being recovered from the inner bark, according to the OTS. The report, prepared by Dr. C. E. Atkins and Ulysses Brooks, contains the results of wartime research on cotton plants conducted at the Johnson C. Smith University, Charlotte, N. C., under contract with the Office of Production Research and Development of the War Production Board.

Chemical analysis and microscopic examination of the cotton plant indicate that its fibers are similar to other paper-making materials in the length and quality of fibers. Tall, thick stalks grown in the Mississippi Valley and in South Carolina give a good yield of high quality fibers. Papers made from these stalks have a good bursting strength, take ink remarkably well when neither filler nor size is used, but have a somewhat low folding endurance, according to the report.

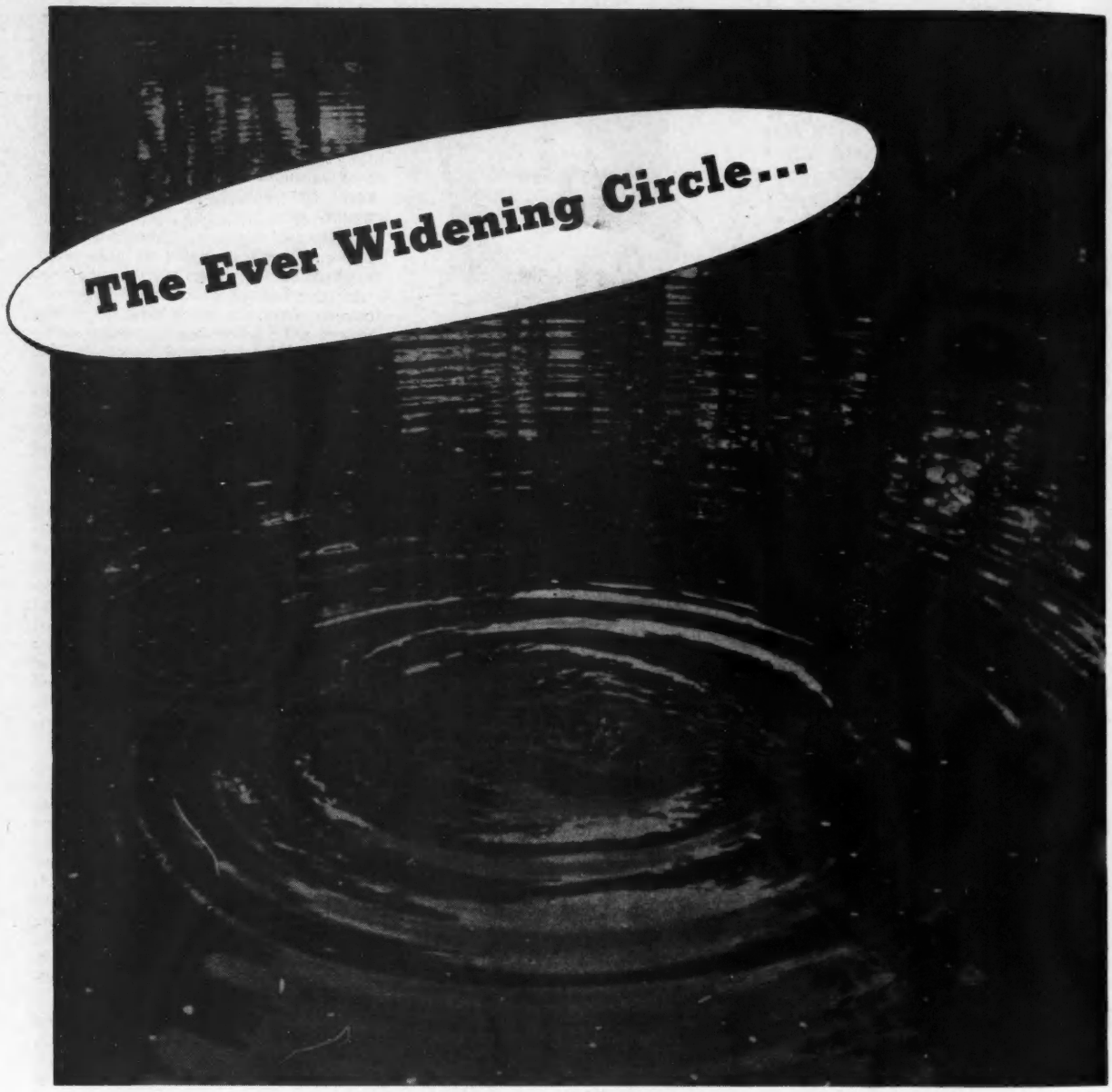
Results of experimentally cooking the pulp with various chemicals under different conditions of concentration, temperature and pressure are tabulated in the report. The best results were obtained with solutions of sodium hydroxide alone or mixed with sodium sulphide, and the best sheets were formed before the pulp dried. The sodium sulphide treated sheets had the best fold, tear and bursting strength. High pentosan content increased bonding strength and natural sizing.

The report recommends removal of the worthless outer bark and pith, harvesting of cotton plants during the slack labor season and establishment of paper mills in areas where strong cotton plants are available.

Champion Force Rejects Paper Workers Union

HAMILTON, Ohio — By a vote of 1,321 to 921 employes of the maintenance and production departments of the Champion Paper & Fiber Company have rejected the Independent Paper Workers Union as a bargaining agent. The election was conducted under supervision of the National Labor Relations Board (NLRB) with 2,776 employes certified as eligible to vote.

Originally the election was planned to determine whether workers would be represented by the independent union, the CIO, or be without organized representation but CIO officials, a week ago, asked that the union be withdrawn from the issue.



IN the few short years that Rayco Linter Cotton has been available for use as a base material in the manufacture of fine cotton content paper, the group of enthusiastic users has increased steadily.

News of the success of this furnish has spread from mill to mill. Experience has shown Rayco Linter Cotton is always delivered clean, ready for the cooker, and that it speeds production by eliminating rag room operations and reducing cooking time.

Get in touch with us and arrange for a Rayco engineer to give you an in-the-mill demonstration—a demonstration that will prove that Rayco Linter Cotton is easily adaptable to your own process and equipment.

THE RAILWAY SUPPLY & MFG. CO. and Affiliates

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RAYCO LINTER COTTON

How much do you pay out for corrosion losses?

—that you could stop with Stainless Steel

OVER 3 billion dollars a year is the nation's staggering bill for corrosion. Of this, sulphite mills pay an estimated average of $10,000 per mill per year. Those mills that are well protected by Stainless Steel contribute very little to this toll.

Why? Because in Stainless Steel they've found the answer to many of the paper maker's toughest corrosion problems.

For example, polysulphides, sulphites, sulphides and other organic constituents of process liquors that cause pitting, scaling and premature aging of equipment are more safely handled by U·S·S Stainless Steel. Equipment thus protected stays longer in service, "down" time is decreased, contamination losses are reduced, replacement and maintenance costs are lowered.

Digester outlet nozzles lined with Stainless Steel have taken on a new lease on life. In digester strainers, when made of U·S·S Stainless, corrosion and erosion troubles have been so decreased that a ten-fold increase of life has been reported. U·S·S Stainless Steel tubes in the first effect of sulphate evaporators have lasted 16 times as long as carbon steel tubing. Stainless Steel winding wire and cloths in cylinder molds, washers and save-alls stay in service for years instead of weeks. U·S·S Stainless Steel beater bars and Jordan linings not only last far longer but have eliminated paper contamination due to corrosion and abrasion of ordinary steel. In short, it seems safe to say that the more you use U·S·S Stainless Steel the less trouble you'll have with corrosion—and the less corrosion will cost you.

[The various U·S·S Chromium and Chromium-Nickel Stainless Steels we can supply to combat corrosion and increase efficiency in paper mill equipment differ not only in their resistance to corrosion, but their strength under high temperatures is not the same, they have different hot and cold working properties and are unlike in their machining characteristics. They also vary considerably in cost. That's why it will pay you to consult with our engineers to ensure the most economical and efficient application.]

U·S·S STAINLESS STEEL

SHEETS · STRIP · PLATES · BARS · BILLETS · PIPE · TUBES · WIRE · SPECIAL SECTIONS

USS STAINLESS STEEL — UNITED STATES STEEL

7-593

UNITED STATES STEEL AMERICAN STEEL & WIRE COMPANY, Cleveland, Chicago & New York
CARNEGIE-ILLINOIS STEEL CORPORATION, Pittsburgh & Chicago · COLUMBIA STEEL COMPANY, San Francisco
NATIONAL TUBE COMPANY, Pittsburgh · TENNESSEE COAL, IRON & RAILROAD COMPANY, Birmingham
UNITED STATES STEEL SUPPLY COMPANY, *Warehouse Distributors*, Chicago : UNITED STATES STEEL EXPORT COMPANY, New York

Hardenbrook Warns Of Collectivism

GLENS FALLS, N. Y.—A long-range program of mass-education for adult Americans, re-emphasizing the benefits of democracy and their heritage of freedom, is needed to combat the growth of collectivist thought in this country, according to Donald J. Hardenbrook, vice-president of Union Bag & Paper Corporation. Speaking April 10 at a meeting of the Glens Falls Foreman's and Executives' Club at the Queensbury Hotel, Mr. Hardenbrook said every voter should be re-acquainted with the social, economic and political freedoms maintained under the American free enterprise system.

"Although resistance to the philosophy of collectivism has stiffened in recent months, our democracy is still in great peril," Mr. Hardenbrook said, adding:

"The insidious and subversive forces which for years have been penetrating the fabric of our national thought and institutions are still at work. Collectivism moves forward by a series of sudden plunges, and history shows that dictatorships are never really apparent to the people of a country until they are actually in power. The modern history of Russia, Germany and Italy are striking examples of such transitions.

"I wonder how many people appreciate the firm foothold collectivism has in America today? To be sure, it is not here in the form of a controlling political party or system of government, but it is here in the state of mind of a large portion of the American people. It is expressed in their apparent willingness to turn most of their troubles over to the government. It is here in the demand for government to solve all economic problems, rather than bringing about their solution through tried and true economic means combined with the pressure of an aroused public opinion in behalf of that which is sound."

Collectivism is on the march in the world, Mr. Hardenbrook declared — in the Orient; in Europe where Russia is pushing the Balkan countries toward dictatorships; in France and Italy; even in England where the first step has been taken. The big decision of the next few years is whether the United States shall follow that trend.

"We must become vigilant immediately if we are going to save freedom and liberty in America," he concluded. "Labor and capital must join hands, heads and hearts in a sincere effort to combat the common enemy—collectivism."

Mr. Hardenbrook's talk was heard by 250 members of the Foreman's and Executives' Club, and was also broadcast over Station WWSC.

Pulp Consumers Endorse Alaskan Pulp Development

WASHINGTON, D. C.,—Approval by the Association of Pulp Consumers, Incorporated, of the development of a market wood pulp industry in Alaska has been placed in the record. The limited amount of wood pulp estimated to be available this year from European producers it was said again focuses attention on the necessity for increasing the production of market wood pulp in this country.

In its endorsement of a market wood pulp development in Alaska, the Association outlined the current wood pulp situation to the Secretary of Agriculture under whose direction the forests are administered, and the Secretary of the Interior who supervises the development of the Territorial policy. It was pointed out that less than half of the 2,535,797 short tons of market wood pulp consumed during 1946 in the production of paper and paperboard, was produced in the United States, 25.9 per cent was imported from Canada, 25.9 per cent from Sweden, and 3.6 per cent from Finland. The number of domestic firms producing wood pulp exclusively for sale has been decreasing, and presently there are but seven of which one sells nearly all of its production to the rayon industry.

Midwest Paper Spotty Waste Remains Steady

CHICAGO—The paper trade here continued to give no indication of any betterment in the supply situation. The only possible exception reported was in rag content papers where a slightly better supply was indicated in some sources. The sulphite bond market was reported sold out for approximately the balance of 1947 while newsprint representatives here stated that the outlook was not at all good for any increase in the supply. "Plans are going ahead in Washington and about everywhere else," reported one local executive, "but plans take time and construction takes time. We are not optimistic."

The waste paper market, following the changes of last week, was reported to be holding steady with mill prices quoted at $20 a ton for No. 1 mixed paper, $25 for No. 1 news and $36 for No. 1 old corrugated papers. Most mills are said to be running at capacity consumption, according to trade representatives here. The heavy rains of last week held up operations temporarily in a few points in Michigan and Illinois and there was an additional handicap arising from the flooded condition of railroad tracks which made unloading a real problem. However, local reports indicate that accumulations of waste paper have not been materially affected by the rains and remain at a high level in this area.

Paper Wages Rise to $43.48 in Wisconsin

MADISON, Wis. — The Industrial Commission of Wisconsin has compiled comparative records for the years 1940 to 1946, inclusive, listing average weekly and hourly earnings and the average number of hours worked in each of these years.

While there has been a decline in the number of hours worked during the peak year of 1945, the average hourly and weekly earnings have climbed constantly.

In the paper and allied products industries the average weekly earnings have risen from $26.12 in 1940 to $43.48 in 1946. Other weekly averages, year by year: 1941 — $29.29; 1942 — $32.64; 1943 — $36.09; 1944 — $39.32; 1945—$41.37. For the paper and pulp manufacture the averages were a little higher, $26.66 having been paid in 1940 and $43.96 in 1946, with proportionate yearly increases. For paper containers and boxes the 1940 average was $24.49 and the 1946 average $41.59.

Average hourly earnings for the seven years: 1940—64.2 cents; 1941—68.5; 1942—77.3; 1943—81.8; 1944—82.4; 1945—85.5; 1946—98.2 cents. For the paper and pulp industry: 65.3 cents in 1940 and 99.8 cents in 1946; paper containers and boxes: 62.1 cents in 1940 and 93.0 cents in 1946.

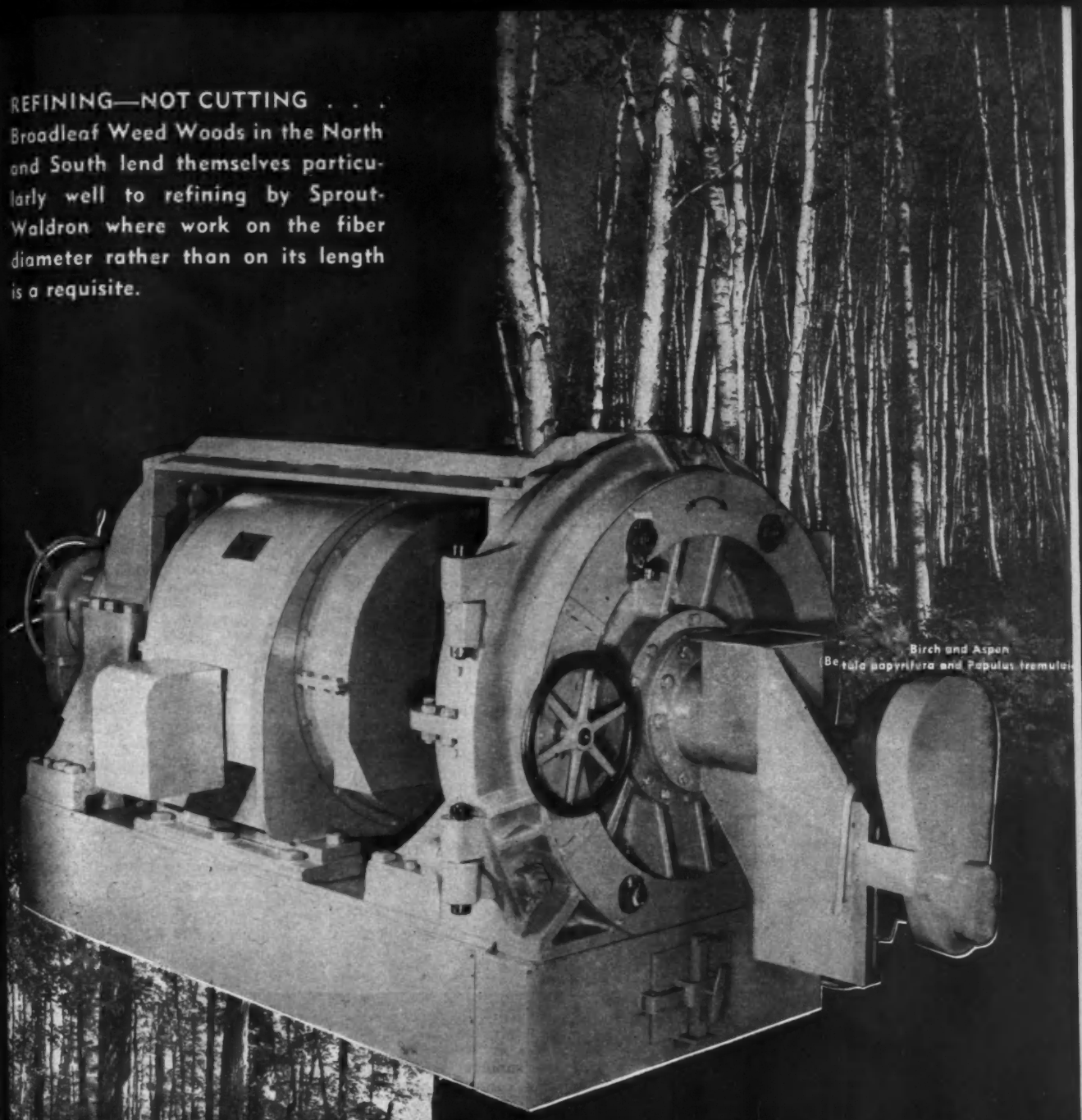
Average hours worked per week in paper manufacture and allied products: 1940 — 40.7; 1941 — 42.7; 1942 — 42.3; 1943 — 44.1; 1944 — 47.7; 1945 — 48.4; 1946—44.3. In the paper and pulp industry the tendency was for the hours to average a bit higher. For example, in 1940 the average week was 40.8 hours, and in 1945 it was 48.9 hours. In 1946, however, the average was 44.1.

Supervisory employes above the working foreman level and their clerical office staffs were not included in the commission's compilation. Earnings at overtime pay were included, and the average weekly earnings were based on aggregate payrolls prior to deductions for the withholding tax, old age insurance, union dues, bond purchases, etc.

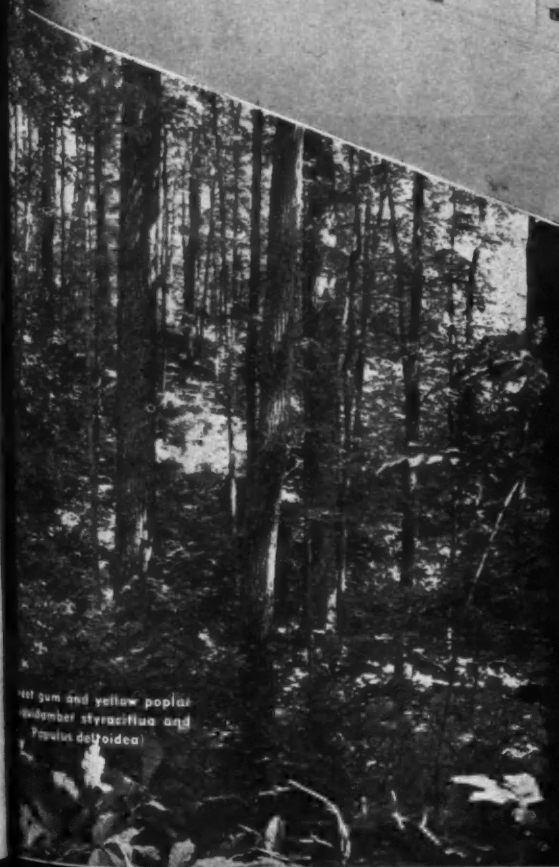
Raybestos-Manhattan Advances Matthews, Cilley, Manheim

PASSAIC, N. J.,—At the annual stockholders' meeting of Raybestos Manhattan, Inc. held at the Biltmore Hotel, New York City, and at the directors' meeting immediately following, two vice-presidents and a director were added. Those honored by these promotions are: John H. Matthews elected vice-president in charge of the Manhattan Rubber Division, Passaic, N. J. O. H. Cilley assistant gen. mgr. of the United States Asbestos Division, Manheim, Pa., was made a vice president; A. F. Peinsohn, general manager of General Asbestos and Rubber Division, North Charleston, South Carolina was placed on the new Board of Directors.

REFINING—NOT CUTTING . . .
Broadleaf Weed Woods in the North and South lend themselves particularly well to refining by Sprout-Waldron where work on the fiber diameter rather than on its length is a requisite.



Birch and Aspen
(Betula papyrifera and Populus tremuloi



...et gum and yellow poplar
...ydamber styraciflua and
Populus deltoidea)

Competent assistance in your planning is a free discharge of Sprout-Waldron service.

SPROUT-WALDRON & CO.
Manufacturing Engineers
MUNCY PENNSYLVANIA

Kalamazoo TAPPI Considers Printing

KALAMAZOO—The need for a greater degree of understanding between the graphic arts and the paper industry was outlined at a meeting of the Kalamazoo Valley Section of the Technical Association of the Pulp and Paper Industry at the Columbia Hotel last week. The speaker was Harry L. Gage, vice-president of the Mergenthaler Linotype Company, Brooklyn, N. Y.

More than 80 TAPPI members and guests were present when Robert Mashburn, chairman, called the meeting to order after the dinner and introduced the toastmaster, Frank French, president of the French Paper Company, Niles. French introduced a number of leaders in the paper and graphic arts industries, and then called on Gage.

Gage declared that one of the great needs is a more thorough mutual understanding between the two industries for there is a divergence due to a lack of appreciation of one group of the technical problems faced by the other. He urged institution of papermaking classes in colleges along with studies in the graphic arts.

Failure of the latter group to clear up points of divergence, Gage said, was due in part to concern with other problems, chiefly with maintenance of freedom of the press. "This," he said, "is one thing we should hold dear as one great prize of our citizenship, for it is the last barrier in the world that can resist the inroads of pressure groups.

Fred Elliot, of Time, Inc., explained a display of materials and equipment used in testing of printing and printing materials. Vance Vallandingham, of the Kalco Company, demonstrated and explained the validity of his company's smear test as an index of paper printability.

V. B. Browne Named Heppenstall Consultant

PITTSBURGH,—Vere B. Browne has been named research consultant to Heppenstall Company, of this city and Bridgeport, Conn. Mr. Browne, who became an honorary vice-president when he retired in January as vice-president and technical director of Allegheny Ludlum Steel Corporation, continues as research consultant also of that organization.

Mr. Browne has been associated with the research and development of high alloy steels since 1909 when he was named chief chemist of Allegheny Steel. He is considered an outstanding authority and pioneer in the development and manufacture of alloy steels.

Lloyd R. Cooper, acting director of Heppenstall research, has been placed in complete charge of the management of the company's newly opened research laboratory and will direct the Heppenstall research program.

Stanley Works Advances Bristoll

NEW BRITAIN, CONN.—Harrison C. Bristoll, general manager of the steel strapping division of the Stanley Works was elected vice-president of the company by the Board of Directors at the annual meeting.

TAPPI Heads to Visit Professional Group

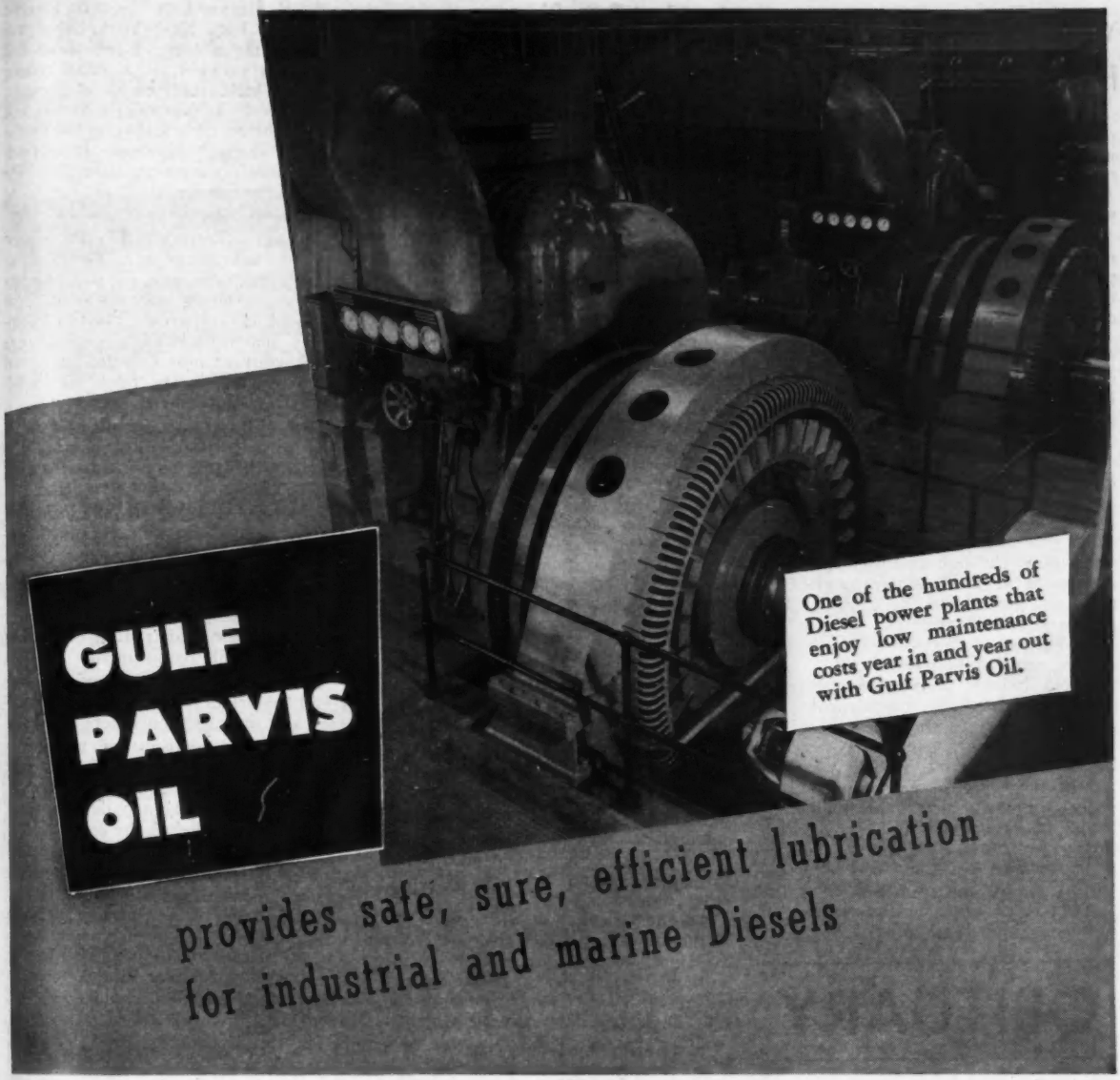
CHICAGO — One of the finest programs to be presented since its organization several years ago has been arranged for the April meeting of the Chicago Professional Paper Group (section of TAPPI) for its April meeting, to be held Monday evening, April 21, at the Chicago Bar Association. The Group will hear Allen Abrams, of the Marathon Corporation, Rothschild, Wis., discuss "Research as a Business." Mr. Abrams is one of the best known and most widely recognized authorities on subjects pertaining to the pulp and paper industry. It is always an occasion of great importance when he is scheduled to discuss a subject relating to his chosen industry.

The Group will also be honored by a visit from Kenneth Geohegan, of the Aetna Paper Company, Dayton, Ohio, who is chairman of the Section Committee of TAPPI. Mr. Geohegan will take as his subject, "Local TAPPI Activities," a subject which will be of absorbing interest to the membership, as this organization just recently affiliated itself with the national society.

Another high-light of the evening will be the appearance of W. E. Brawn, president of TAPPI, who will officially welcome the Chicago Group into the national organization. He will explain the purpose, objectives and functions of TAPPI and will dwell at length on the relationship between the national group and its sectional affiliates.

Widespread interest is being aroused over the program for this meeting, as it brings together men of wide renown in their particular fields, and in the paper industry. Plans are being made for a record attendance.

AT TAPPI KALAMAZOO DINNER MEETING
(Standing) left to right, Lee H. Mimms, program chairman; F. H. Stowitts, Omar Cook, Paul F. McCue, Walter Gage, Harry W. Nolte, (Seated) Myron Flotow, TAPPI Treasurer Frank French, Harry F. Gage, R. T. Mashburn, Vance Vallandigham, Fred Elliot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This quality Diesel lubricating oil provides a higher degree of protection for vital Diesel parts —helps prevent excessive wear that leads to below-par performance and high maintenance costs. And remember this important plus value when you use Gulf Parvis Oil: The helpful counsel of Gulf Lubrication Engineers, specialists in scientific Diesel engine lubrication!

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Wisconsin Distributes Half Million Trees

MERRILL, Wis.—Five hundred thousand seedling trees will start on their way to Wisconsin Valley land owners on April 21st, when the third annual Trees for Tomorrow Inc. "2 for 1" reforestation plan gets under way.

Right now applicants for trees are receiving cards confirming orders after planting sites and soil conditions have been checked and approved. In some cases a more suitable species has been substituted from the type requested following an on-the-spot survey made by the Trees for Tomorrow forester. In all cases the number of trees each individual will receive has been scaled down. This has been necessary because requests exceed a million seedlings while only half a million are available due to the shortage of planting stock.

At tree distribution time foresters will follow through and give technical assistance to land owners while the trees are going into the ground. The time and tree distribution sites in the six counties of the Wisconsin Valley will be announced later.

About twenty percent of the trees will be planted by mechanical tree planting machines this spring.

M. N. Taylor, executive director, Trees for Tomorrow, said that rationing of trees has been inaugurated in order to give the maximum number of people an opportunity to carry on with their reforestation programs. Seedlings are purchased by Trees for Tomorrow from the state nurseries and from the surplus stock of Federal nurseries in Wisconsin and Michigan.

OBITUARY

P. M. Allen

PORT HURON, Mich. — P. M. Allen, 58, Dunn Sulphite Paper Company sales executive for about 15 years, died Easter Sunday morning in Port Huron Hospital after a long illness. Widely known throughout the paper industry as "Dick" Allen, his personality and integrity were highly regarded.

Born in Paulding, O., May 31, 1888, he was graduated from Hamilton College, N. Y., where he was a member of Sigma Phi. He was also associated with Theodore W. Dunn, president of the Dunn firm, for a number of years when Mr. Dunn was with the Detroit Sulphite Pulp & Paper Company.

After managing the Peshtigo, Wis., mill, Mr. Allen joined the Combined Locks Paper Company prior to coming to Dunn Sulphite Paper Company in 1932. He served and took an active part in the Tissue Association of the American Pulp and Paper Association.

Mr. Allen is survived by his widow, four sons and one daughter.

Accident Rate Rises In Ontario Operation

Toronto, Ont.—The Ontario Pulp and Paper Makers' Safety Association meeting this week in Toronto reported a considerable increase in the number and frequency of accidents during 1946 in mills and woods operations of member companies. President W. N. Corbett emphasized the responsibility of employers to prevent accidents to workers. He said the aim of the association was to encourage its members in discharging this obligation.

Trophies were presented winners of accident-prevention competitions. Howard Smith Paper Mills, Ltd., Cornwall division, ranked first among the larger mill units, with .036 days lost per 1,000 man hourse worked. Garden City Paper Mills, St. Catharines, among the smaller mills, stood second, with a corresponding figure of .054 days. Kenora logging division of the Ontario-Minnesota Pulp and Paper Company, among woods operations, ranked third, with a score of 45.4 lost-time injuries per 100,000 man days worked.

Container Problems Challenge Industry

(Continued from page 7)

an inquiry he is conducting into the packaging of products ranging in weight from 100 to 170 pounds per cubic foot. The basic principles he has discovered, he said, would be useful in packaging products by many other industries.

Another speaker at the session, W. Rutherford James, treasurer of Towns & James, Inc., Brooklyn, told of the work being done by a special committee appointed by the National Wholesale Druggists Association, which is studying correct container unit sizes for packaging pharmaceutical products.

This year's exposition, described as the "biggest and best ever," has attracted far greater attention than anticipated. During the first two days of the four-day show, more than 11,000 persons, chiefly management, advertising and factory production executives, viewed the exhibits. Last year's exposition drew a total of 10,000, the previous record.

E. A. Throckmorton, president, Container Laboratories, Inc., Chicago, presided at this afternoon's panel entitled "Shipping Container Clinic." One point brought out was that manufacturers of egg cartons and containers are facing a new problem because hens are laying larger eggs. The latter was credited to improved breeding.

The general consensus of the panel was that the current shortage of containers was due not so much to a shortage of materials as to greatly increased demand. Already, it was agreed, the old peak production figures have been surpassed without meeting the demand.

W. R. Hummel, of Western Electric Company, Inc., New York City, gave those in attendance at the panel discussion a preview of a small testing device which, inserted in a package, will record the number of drops and the height of each fall received by the package during shipment. It will enable manufacturers to determine the sort of handling a package has to be able to withstand, he explained.

Packages for re-use, like the jellies' container which can be used for drinking glasses, are one of the exhibits features. Among such item are the National Transparent Plastics Company's plastic whiskey containers which convert into knitting bags, and gift wrapping for perfume which become stars for Christmas trees.

The serious shortage of raw materials for the packaging industry has shown little — if any — improvement during the past twelve months.

Expanded demands from fabricators have cancelled out any expanded production of fiber board, paper board, wrapping paper, glass and plastic materials manufacturers and the packaging industry is still forced to rely on substitution and trading of various materials to fill requirements.

This was the consensus of raw material manufacturers, package fabricators and package consumers.

The serious scarcity of raw materials, most observers believed, may well account for the fact that no significant new packaging developments have been unveiled at the exposition.

The raw material situation is further complicated by a significant shift of emphasis from quantity to quality on the part of package consumers brought about by keener competition and stricter merchandising methods in the large consuming trades such as cosmetics, drugs, household goods and foodstuffs.

The trend is toward the selection of materials and types of containers and stricter specifications as to size and manufacturing quality.

Bag makers report a particularly acute raw material problem with their requirements running as high as 50 percent more than the amount of paper they are able to get.

Manufacturers of plastics materials have reported some accumulation of inventories, although this has not been generally the rule.

Paper manufacturers are hoping for a slightly eased wood pulp supply situation once Scandinavian ports are ice free and exports are possible once more. Scandinavian wood pulp trade is not expected to export more than approximately 50 percent of the total production, however, because of large domestic needs, observers said.

Inequalities of distribution of both packaging raw materials and packages for consuming industries is still prevalent, most observers stated. The distribution problem is expected to iron out toward the end of 1947, however.

Take a Tip From the Products You Use Every Day...

They're made with the aid of BECKMAN pH CONTROL!

WHAT ABOUT YOUR PRODUCT?

FEW PEOPLE—even those in industry themselves—realize the many diversified ways Beckman pH Control is being used to cut costs, reduce waste, improve operating efficiencies and insure a more uniform quality in dozens of products of daily use. For example...

The gasoline you use was probably refined with the aid of Beckman pH Control. Major refineries use Beckman pH Equipment to control the acidity of their processing operations, thus, not only improving the product, but also minimizing corrosion of costly plant equipment.

The paper you read in your magazines and books, as well as that which you use in your own catalogs and literature, are both made under the close control of Beckman pH Equipment. The paper mills manufacturing the finer qualities of paper use Beckman pH Control to regulate acidity in their processing operations and to insure more uniform printing qualities in the finished paper.

The sugar you eat was undoubtedly refined under the close control of a Beckman pH instrument—for accurate pH control has become an indispensable part of every well-managed sugar refinery.

The suit you wear, as well as your sox, shirt and other textiles you and your family use were probably produced with the aid of Beckman pH Control. It insures color-fastness, more uniform quality, greater strength in the finished fabric.

WHY NOT YOUR PRODUCT? Example after example can be cited where the job is being done better *for less* by means of Beckman pH Control. Chances are in *your* plant there are many important savings to be made through the installation of Beckman pH Control. Wherever there's water, there's pH—whether in chemical solutions, fluid pulps, moist pastes, sludges, industrial wastes or vat and tank processes. And wherever water or water solutions are used, chances are product quality can be improved, waste reduced and operating efficiency increased through the use of Beckman pH Control.

Why not find out about *your* product? Our trained engineering staff will be glad to work with you in recommending what can be done—possibly is already *being* done—in your particular field of industrial operation. *Beckman Instruments, National Technical Laboratories, South Pasadena* 16, *California.*

FACTS YOU SHOULD KNOW ABOUT BECKMAN pH EQUIPMENT

...that Beckman pioneered modern glass electrode pH equipment, transforming the cumbersome laboratory apparatus formerly used into a compact, practical portable instrument that paved the way for today's simplified pH measurement and control.

...that the first completely automatic glass electrode pH indicator, recorder and controller was pioneered by Beckman. Operating entirely without batteries, this instrument made automatic process control accurate, convenient, practical—and is today widely used in all parts of the world.

...that the only High Temperature Glass Electrode system available today is a Beckman achievement. This electrode system for the first time, enables continuous pH measurements to be made at temperatures up to 212°F (100°C) and is of tremendous value wherever hot process fluid must be controlled.

...that the only High pH Glass Electrode system is also a Beckman development. This is the only glass electrode that can be used to measure high pH values even in the presence of sodium ions...and extends the usefulness and accuracy of glass electrode equipment to many industries where alkaline solutions in combination with sodium ions have heretofore presented difficulties.

The above are only a few of many developments that make Beckman pH Equipment the only pH instruments embodying every modern advancement in the field of pH measurement and control.

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BECKMAN INSTRUMENTS CONTROL MODERN INDUSTRIES

A-C Develops a Quicker Way To Make Graphic Flow Sheets

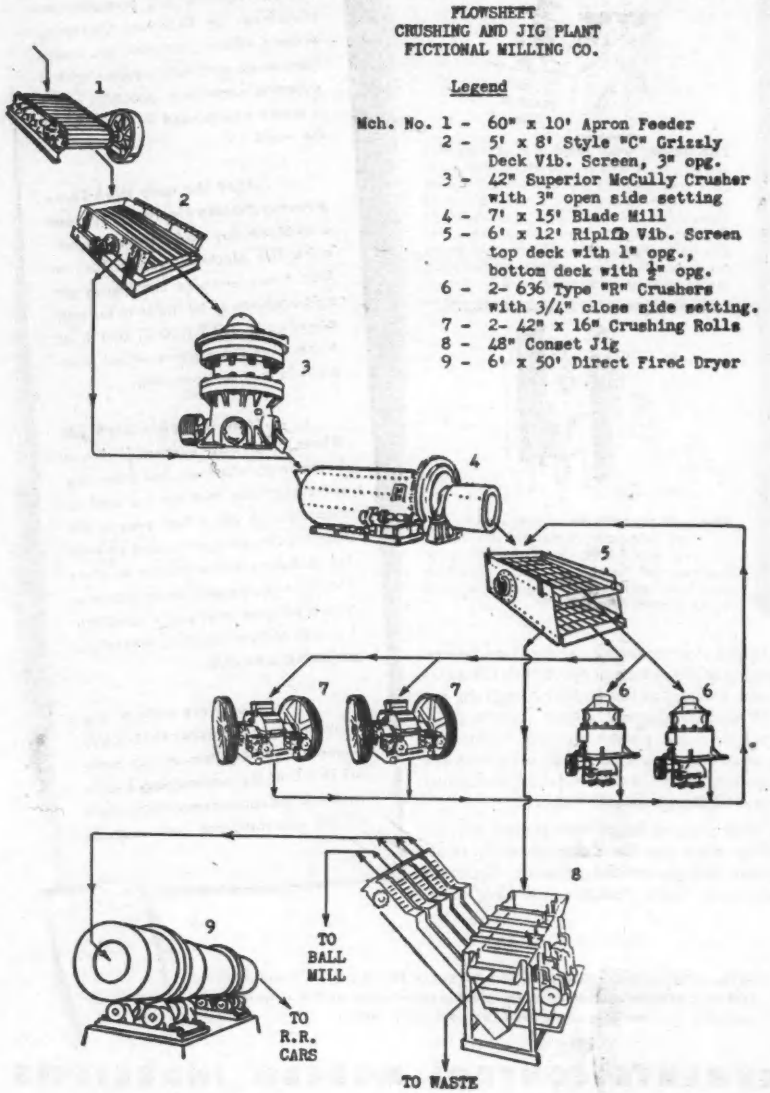
MILWAUKEE—Rubber stamps moulded from zinc cuts have proven a great aid in helping to produce graphic flow sheets quickly, accurately and inexpensively for Allis-Chalmers product departments.

At the outset, in an effort to secure the advantages of a pictorial flow sheet without the high cost involved, Stanley D. Michaelson, director of the company's basic industries research laboratory, and originator of the plan now in use, experimented with various devices.

An attempt to use templates, one for each of the various machines, was not too successful since they did not show sufficient detail to be entirely satisfactory, nor did their use appreciably cut drawing time. In addition, they were awkward to handle and damaged easily.

In contemplating the use of rubber stamps for each machine, perspective line sketches were first prepared from equipment photographs. Zinc cuts were then made from these sketches and the rubber stamps finally moulded from the zinc cuts. These stamps are used with a pad saturated with an opaque type black stamp pad ink and an impression of the proper machine made at the appropriate place on the chart. Flow lines are then added to show material travel and descriptive information lettered or typed on the sheet as needed. With the use of good tracing paper and proper stamp pad ink, excellent prints can be made from the original.

The attached fictional flow sheet made with nine different rubber stamps required only a half hour to draft compared with about eight hours required for an equivalent pictorial flow sheet made by a draftsman and an estimated 1½ hours for drafting an equivalent descriptive flow sheet.


FLOWSHEET
CRUSHING AND JIG PLANT
FICTIONAL MILLING CO.
Legend
Mch. No. 1 - 60" x 10' Apron Feeder
2 - 5' x 8' Style "C" Grizzly Deck Vib. Screen, 3" opg.
3 - 42" Superior McCully Crusher with 3" open side setting
4 - 7' x 15' Blade Mill
5 - 6' x 12' Riplfb Vib. Screen top deck with 1" opg., bottom deck with ½" opg.
6 - 2- 636 Type "R" Crushers with 3/4" close side setting.
7 - 2- 42" x 16" Crushing Rolls
8 - 48" Conset Jig
9 - 6' x 50' Direct Fired Dryer
1
2
3
4
5
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7
8
9
TO BALL MILL
TO R.R. CARS
TO WASTE

Rubber Stamps Help to Assemble a Flow Sheet Diagram Quickly

The cost involved in producing the stamps is not high. For each stamp an electrolytic zinc cut is required, costing about $3. From this, any number of rubber stamps can be made at a cost varying from $1 to $2.50 depending upon the size of the stamp.

Pictorial flow sheets are preferable to descriptive ones since they simplify understanding of the equipment layout. At the same time, they are seldom made because of a shortage of drawing talent and the resulting high cost. The method devised by Mr. Michaelson should prove highly advantageous to consulting engineers, manufacturers, authors, and others required to make many flow sheets in the normal course of operations.

Consulting engineers or others who would like to secure stamps such as those produced on the accompanying flow sheet at cost from the 40 odd zinc cuts already made by Allis-Chalmers for various types of equipment, are invited to communicate with Mr. Michaelson at Allis-Chalmers, Milwaukee 1, Wis.

Heavy-Duty Synchronous Motors Are of Splash-Proof Type

MINNEAPOLIS — Newly available "Heavy-Duty" synchronous motors for constant-speed drives up to 1000 hp. are available in splash-proof construction by the Electric Machinery Manufacturing Company. This type is often desired in paper mills, chemical plants, mining and milling operations, and for pumping jobs.

The stator frame is of steel, strong without excessive weight. Brush inspection and blowing out is simplified with access plates designed for speedy removal and replacement. Sealed bearings can be cleaned and refilled without motor disassembly. Double-end ventilation is provided by a blower on each end of the rotor. Exciter also is fitted with blower. The new motor is available in unity or leading power factor, with torque and kva requirements to suit the job.

Fenwal Catalog is a Thermal Handbook

ASHLAND, Mass. — Fenwal Incorporated, well known in the field of temperature detection and control for its Thermoswitch thermostats, has recently released a new catalog which is outstanding from the point of view of design and layout. It is a basic handbook of Thermal procedure. Engineers concerned with temperature regulation and control in all industries will find in it a wealth of thermotechnic data.

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PC GLASS BLOCKS

Panels of PC Glass Blocks assure ample light, properly distributed. That enables workers to turn out more quality goods.

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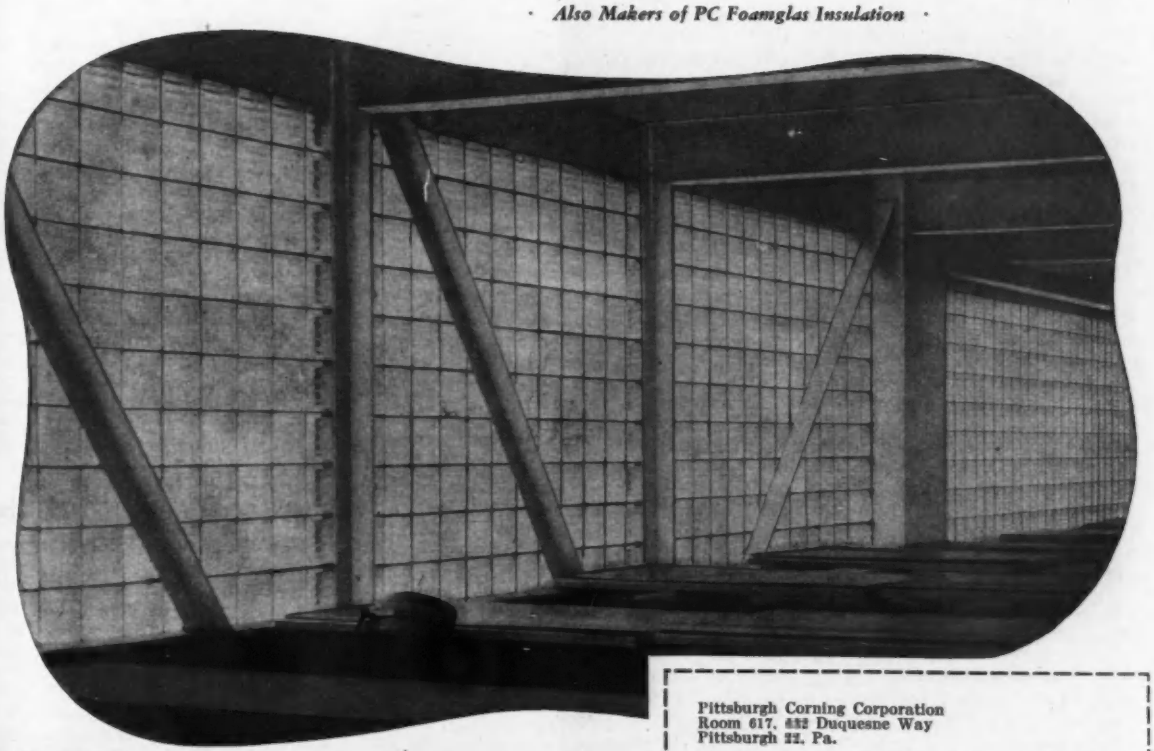

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Fowler Cites Costs As Factor of Price

MONTREAL—R. M. Fowler, president of the Newsprint Association of Canada, issued this week a statement defending the industry's price policies. He cited the formerly depressed condition of the industry and refers to increased operating costs now experienced.

"Distorted and incomplete reports concerning newsprint supply, price, and distribution have appeared recently in some sections of both the United States and Canadian press as well as in trade magazines of the United States publishing industry.

"A recent bulletin of the American Newspaper Publishers Association is a typical example. The entire eight-page issue is devoted to a collection of press reports carefully selected to leave the impression that Canadian newsprint mills are making 'enormous profits' and are taking advantage of the present paper shortage to 'get all the traffic will bear.' In these press reports no attempt is made to point out that newsprint sold at depression levels during most of the war years when prices were frozen.

"There is no reference to the fact that price adjustments granted by the Government near the end of the war and after the war did little more than compensate for increased production costs and loss of exchange premium. No attempt is made to point out that as far back as 1931 when the price was forced down to $57 per ton, Canadian companies started to go into bankruptcy and by the middle thirties over half the Canadian industry was in bankruptcy or receivership.

"Instead, depression prices are selected as a basis for meaningless percentage comparisons. Several newspapers have printed a table using the low and inadequate profit levels of 1943 as a base for showing substantial percentage increases in profits for 1946. In 1943 the financial position of the newsprint industry was so bad that Canadian Government officials had to go to Washington to insist that the Office of Price Administration increase newsprint prices in order to maintain the Canadian industry in production.

"Every price increase since 1938, except the recent price advance of $6 effective April 1 of this year, was granted by OPA after study of cost increases, as required by the United States price control regulations. The last $6 increase was announced by some companies after figures of wood costs for the past season became available. These wood costs were higher than the industry had anticipated and were substantially increased by efforts made to obtain sufficient wood for capacity operations.

"In addition, since the last Government price increase last October there were increases in transportation costs, stumpage and ground rents, coal prices, labor costs, and many other extra expenses involved in maintaining full production.

"It is most extraordinary that the recent criticism about the profits of newsprint producers should come from any newspaper publisher. These publishers are the proponents of the system of free enterprise. They seem to overlook the fact that a free and prosperous newsprint industry is a necessary foundation for their own enterprises and for the system in which they believe.

"For ten years the Canadian newsprint industry — the major source of the raw material needed for a free press—has been subject to Government control. In the thirties more than half the newsprint capacity of Canada was in bankruptcy or receivership, and provincial governments were compelled to step in to avoid the complete destruction of the industry. If a similar situation is to be avoided in the future newsprint mills must be financially able to repair the damages of the depression years and maintain themselves on a firm basis. Newspaper publishers might well consider that it is in their basic self-interest to have their newsprint supplies come from mills that are financially sound and do not require assistance from governments."

A second step forward resulted from an improved labor situation which enabled the planting, during 1946, of 7,531,000 seedlings on 10,707 acres. While this does not constitute a record year, the amount quoted having been exceeded in 1941, 1943 and 1944, it does perhaps indicate the trend of planting possibilities in the near future. With both planting stock and the men to plant it available, little difficulty should be encountered in reaching our objective.

The recent session of the Legislature approved reforestation expenditures for the fiscal year 1947-1948 far higher than in any previous fiscal year. Hitherto, expenditures have not exceeded a "high" of $165,000 but, in the forthcoming year, funds to a total of $469,000 — nearly treble any previous figure—have been provided.

Late in 1946, recognition of the vital need for and growing importance of the work of reforestation was accorded, when the responsible organization in the British Columbia Forest Service was elevated to the status of a Division, in charge of a technically trained forester. Hitherto the unit had operated as a section in the Division of Economics (Research) of the Forest Service. Harold G. McWilliams, who has been responsible for the direction of this phase of Forest Service work for several years past, continues in charge of the newly established Division.

Labor Divisions Find Overtime Confusion

WASHINGTON—The 1946 annual report of the Wage and Hour and Public Contracts Divisions, U. S. Department of Labor, declares that violations of the minimum wage, overtime and child labor provisions of the Fair Labor Standards Act and the Public Contracts Act were found in 55 percent of the 500 inspections made in the paper and paper products manufacturing industry during the year ended June 30, 1946. As a result, $152,000 in back wages was returned to some 8,300 underpaid employees.

The report shows that violations of the overtime provisions of the two laws were the most common type found. It also was revealed that ten percent of the inspected employers in the paper and paper products industry had violated the minimum wage provisions of the Fair Labor Standards Act—the Wage and Hour Law. Back wages for violations of the 40-cents-an-hour minimum wage provision of this law—failure to pay $16 a week for a 40-hour week—were paid to more than 1,400 employes. Thirteen percent of inspected employers violated the child labor provisions of the laws.

The Divisions report a frequent cause of unintentional violations is misapplication by employers of the exemption provisions of the Wage and Hour Law, under which certain employees may be exempt from the law's minimum wage and overtime provisions as "executive," "administrative" or "professional" employees. As most manufacturers know, the Wage and Hour Law applies to all employees engaged in interstate commerce or in the production of goods for interstate commerce, and the law's provisions for a 40-cents-an-hour minimum wage and time and one-half for overtime work beyond 40 hours a week apply in all cases unless an employee is specifically exempt. The Public Contracts Act applies generally to employees engaged in filling Government contracts for over $10,000.

Container Offers 100,000 Shares

NEW YORK,—Container Corporation of America this week offered 100,000 shares of 4 per cent cumulative preferred stock, $100 par value. The stock is being offered at $101.50 a share by Kidder, Peabody & Co. and associates. Net proceeds, estimated at $9,863,250 will be added to general funds. These funds may be applied to the company's program of additions and improvements. Expenditures of approximately $16.8 million already have been authorized in this program. The new preferred shares will have the benefit of a sinking fund, starting December 31, 1950, sufficient to retire annually 3% of the total issue. The shares are redeemable at prices from $105 per share and accrued dividends before April 1, 1948, to $101.50 per share after April 1, 1954.

Phillips Develops New Industrial Camera

NEW YORK—A new high-intensity, high-resolution powder camera, developed at Phillips Research Laboratories for X-ray Diffraction work, incorporates a new slit system which produces remarkably clean film patterns and reduces exposure time. The camera is available through North American Philips Company, Inc., 100 East 42nd Street, New York. The new camera has numerous other features such as: 1. Precise collimator and beam tube alignment. 2. Light-tight cover design. 3. Universal saddle (mount) which adapts the camera for use on existing types of X-ray diffraction apparatus made by Philips or other manufacturers. The new camera will be useful for analysis work in such fields as: Metallurgy, Mineralogy, Geology, Ceramics, Cement Chemistry, Drugs, Food, Dairy Products, Petroleum Products, Paint, Plastics, Rubber, Soap, Cosmetics, Water Purification and Sewage Disposal.

Hi-Density Feeder Bulletin Describes Savings Factors

MILWAUKEE, Wis.—Where and how the pulp and paper industry can use the new Hi-Density Feeder developed by the Allis-Chalmers Manufacturing Company, is described in a new four-page bulletin just released. Complete specifications for the unit are provided. According to the bulletin, the new feeder makes it possible for Allis-Chalmers paper stock pumps to handle pulp up to eight percent bone dry consistence without air binding, thereby saving time, steam and providing increased storage capacity of tanks and bleach plant reactors.

Use of the hi-density feeder is said to save the expense of manufacturing and handling wet lap for thickening, eliminate the need of dilution of stock for usual pumping and subsequent thickening for processing, and permit the storing of stock at higher consistencies so that it can be pumped to the beaters at the consistence at which beating is desired.

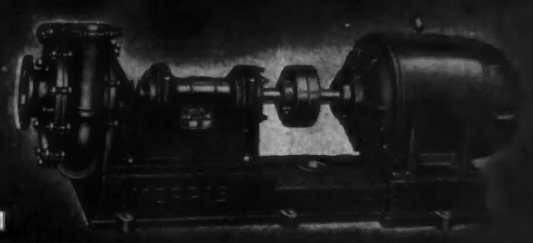
Hooker Improves Its New Products List

NIAGARA FALLS, N. Y.—A new addition of Hooker General Products List, Bulletin 100, has just been published by the Hooker Electrochemical Company. This new bulletin represents a departure from previous products lists in that it now comprises twenty pages of description, principal physical and chemical properties, graphic formulas, uses and shipping information, in new format and arrangement that make it easier to find information on Hooker chemicals.

Several new products and brief descriptions of the various chemical processes and facilities which Hooker has available for industry are also included in this General Products List.

In Your Paper Mill . . .

BLACK LIQUOR Flows More Freely



with

MORRIS SLURRY PUMPS

Make No Mistake About It! The grinding action of abrasive mixtures and the thick, caustic, corrosive liquors of your pulp-making processes, require much more than a clear-liquid centrifugal pump. These factors practically demand a Morris Pump to do the job efficiently without constant servicing.

Why Morris Black Liquor Pumps Are Better

1. Morris Black-Liquor Pumps are hydraulically and mechanically designed for the express purpose of handling liquors containing solids.

2. Wearing parts are actually *twice as thick* as in conventional clear-liquid pumps.

3. The use of corrosion- and abrasion-resisting alloys in this pump is not merely an expedient to lengthen the life of an otherwise unsuitable design, but a true means of augmenting the life period of an *inherently long-enduring unit.*

4. Morris Black Liquor Pumps were designed by Morris Engineers who have been meeting various material-handling requirements for 82 years.

With all these reasons, is it any wonder that hundreds of Morris customers write to tell us about the efficient, satisfactory service of the Morris Pump? For their kind remarks and their confidence in us, we extend our fullest appreciation.

Write today for suggestions on your pumping problems. Our engineers will be glad to give this service free of charge and without obligation.

MORRIS MACHINE WORKS Baldwinsville, N. Y.

MORRIS *Centrifugal Pumps*

Branch Offices in Principal Cities

IMPORTS

NEW YORK IMPORTS

WEEK ENDING APRIL 12, 1947

SUMMARY

Printing Paper	7 cs.
Wrapping Paper	847 rolls
Tracing Cloth	57 cs.
Filter Paper	40 cs.
Drawing Paper	10 cs.
Filter Cloth	2 bls.
Boquet Paper	2 cs.
Miscellaneous Paper	17 bls.

PRINTING PAPER

The Lafayette Co., Titan, London, 7 cs.

WRAPPING PAPER

Clinton Paper Corp., Fort Townshend, St. Johns, N.F., 847 rolls.

TRACING CLOTH

Keuffel & Esser Co., W. A. Richardson, Manchester, 37 cs. (bleached cotton).

E. Dietzgen & Co., Sibley Park, Liverpool, 20 cs. (bleached cotton).

FILTER PAPER

H. Reeve Angel & Co., Inc., Fordham Victory, London, 18 cs.

Karr Ellis Co., Fordham Victory, London, 1 cs.

H. Reeve Angel & Co., Inc., Fort Mattagami, Liverpool, 12 cs.

H. Reeve Angel & Co., Inc., Sibley Park, Liverpool, 9 cs.

DRAWING PAPER

Stevens Nelson Paper Corp., Fordham Victory, London, 1 cs.

H. Reeve Angel & Co., Inc., Fort Mattagami, Liverpool, 3 cs.

International Expediters, Titan, London, 1 cs.

The Morilla Co., John H. Bozeman, Havre, 5 cs.

FILTER CLOTH

W. S. Stanley & Co., Sibley Park, Liverpool, 2 bls. (linen & cotton).

BOQUET PAPER

Hensel Bruckman & Lorbacher, Titan, London, 2 cs.

MISCELLANEOUS PAPER

F. C. Strype, Inc., Veendam, Rotterdam, 10 bls.

Stevens Nelson Paper Corp., Veendam, Rotterdam, 6 bls.

RAGS, BAGGINGS, ETC.

Continental Bank Trust Co., Czechoslovakia Victory, Antwerp, 28 bls. old bagging.

D. Bennedetto, Inc., Coastal Delegate, Havana, 44 bls. old rags.

Amtorg Trading Corp., Sevastopol, •Murmansk, 362 bls. cotton waste.

Tradesmans National Bank Trust Co., Fordham Victory, London, 95 bls. old webbing.

W. J. Green & Co., Fordham Victory, London, 88 bls. old cotton rags.

Irving Trust Co., Titan, London, 20 bls. new cotton cuttings; 38 bls. old khaki webbing.

(———), Sibley Park, Liverpool, 16 bls. new wool thread waste; 6 bls. old wool rags.

Padawer Corp., Arthur J. Tryer, Santos, 32 bls. cotton thread waste.

Chase National Bank, Giorgios CIII, Santos, 161 bls. old rags.

HIDE CUTTINGS

Karr Ellis Co., Sibley Park, Liverpool, 270 bags (dry).

BONE GLUE

Colloids, Inc., Arthur J. Tryer, Santos, 400 bags.

BOSTON IMPORTS

WEEK ENDING APRIL 12, 1947

International Purchasing Co., Czechoslovakia Victory, Antwerp, 63 coils old rope.

Lesavoy Sees Limit To Swedish Exports

NEW YORK—Sweden will have serious difficulty in implementing its drive to increase exports of pulp to the United States despite the recently announced trade restrictions, according to Lawrence Lesavoy, president, Paper Corporation of America. The country is facing shortages of coal, chemicals and wood, he stated, and there is an increasing trend toward dismantling of marginal mills for sale and shipment abroad.

Mr. Lesavoy, who has recently returned after an extensive survey of the paper situation in Sweden during which he bought the Tegefors pulp mill at Jarpen, Sweden, said that material shortages will probably prevent Sweden from exporting the 400,000 tons planned for 1947. This production, he pointed out, is still only one-third of pre-war exports to the United States.

Hooker Would Build Water Intake

BUFFALO, N. Y.—The Hooker Electrochemical Company has applied to the district Corps of Engineers here for a permit to construct a water intake, two 42-inch diameter pipe lines, and a foot bridge connecting the intake with the shore in Niagara River near its Niagara Falls plant.

IMPORTANT DATES TO READERS AND ADVERTISERS

May 29
Superintendents Number

●

October 30th
Tappi Number

●

December 4th
Mill Equipment Number

PLURAL ACTION . . .

Complete wax dispersion, Positive wax retention

SINGULAR RESULT . . .

Improved Sizing!

Laboratory tests effectively demonstrate what users confirm . . . that Nopco Wax Sizes impart all-round water resistance to paper, paperboard, and fiber insulation board products.

Yes, **IMPROVED SIZING,** because with Nopco* Wax Sizes, the finer-than-average particles (less than ½ micron) permit *complete and intimate dispersion* of the wax through the fiber mass.

IMPROVED SIZING, also, because Nopco Wax Sizes when precipitated by alum (their alum sensitivity is remarkable) adhere to the fibers and stay there, assuring you *positive wax retention.*

NOPCO WAX SIZES are offered in two forms—

Nopco 2251-B Wax Emulsifier for mills preferring to make their own wax size.

Nopco 2252 Wax Emulsion for mills preferring a ready-made size.

Write today for informative technical bulletins on Nopco 2251-B and Nopco 2252.

NOPCO CHEMICAL COMPANY
(FORMERLY NATIONAL OIL PRODUCTS CO.)
Boston • HARRISON, N. J. • Chicago • Cedartown, Ga.
Richmond, Calif.

*Reg. U. S. Pat. Off.

NOPCO WAX SIZES

BUT CAN I BUY IT?

Even though some NOPCO products are not now available in the desired volume, we are confident that the situation will gradually better itself. Meanwhile, we shall do our best to keep you informed of any developments. Here is a statement of the current situation on the NOPCO products advertised.

PRODUCT — NOPCO 2251-B WAX EMULSIFIER
NOPCO 2252 WAX SIZE

DELIVERY — Present customers' deliveries good, keeping pace with demands. Due to some tightness in raw materials, however, we are unable to accept new business at the moment, but are glad to submit samples for testing.

PRICE — Based on present costs of raw materials. Any decrease in such costs will immediately be reflected in our price.

OUTLOOK — Expect new installation to be completed shortly. This will increase production facilities.

EVOLVED THROUGH RESEARCH NOPCO

TRENDS

Office of the PAPER TRADE JOURNAL, Wednesday, April 16, 1947.

Paper jobbers and wholesalers report dollar sales and inventories on the increase despite fewer mill suppliers or other sources of purchase. Integrated paper mill operators have made serious inroads on sources of supply to jobbers and wholesalers, while the shifting in type and quality by some manufacturers further aggravate the situation. Nevertheless, wholesalers and jobbers either find new sources of supply or capitalize on the abundance of high grade papers to keep their dollar volume up. Supplies of specialty papers, most top quality papers and paper bags have shown considerable improvement with prices maintaining a steady pace. Kraft papers, tissue papers and most low-priced papers remain tight. . . . High construction costs rule out the possibility of overexpansion in the newsprint industry. With current replacement costs put at $50,000 to $70,000 a daily ton, or better than double former costs, prices of newsprint would have to exceed the present $84 to $90 range to make such new construction feasible. Bowater Paper Company's program of adding 200 tons to its daily capacity will cost about $10 million, or $50,000 a daily ton excluding woodlands and power facilities. Southland Paper Mills will spend 6½ million dollars to step up its current output of 170 tons daily to 350 tons.

The index of general business activity for the week ended April 5 fell to 142.2 from 147.2 in the previous week, compared with 127.3 for the corresponding week in 1946. The index of paperboard production was 179.3, compared with 178.2 in the preceding week and with 162.9 for the corresponding week in 1946.

Paper production for the week ended April 5 was estimated at 105.2 percent, compared with 107.8 for the preceding week, with 104.1 for the corresponding week in 1946, with 86.8 for 1945, with 92.0 for 1944, and with 89.9 percent for the corresponding week in 1943.

Paperboard production for the week ended April 5 was 102.0 percent of capacity, compared with 102.0 percent for the preceding week, with 99.0 percent for the corresponding week in 1946, with 92.0 for 1945, with 94.0 for 1944, and with 95.0 percent for the corresponding week in 1943.

Among the popular new uses for paper are soap leaflets, impregnated with soap, they attract tourists unable to find soap in rest rooms since they can easily carry a book of these leaflets in their purses . . . baby bibs made of paper have been conveniently waterproofed and plasticized while disposable paper diapers are gaining favor . . . tasteless, odorless paper is becoming common in tea bags . . . paper bath mats now absorb water but do not disintegrate while paper lampshades are now being made flame or heat resistant . . . a new American standard covering the sensitometry of photographic papers is now available to photographic paper manufacturers for control testing and for consumers who want to make prints without recourse to trial and error.

Wood Pulp Consumers, Inc., are in favor of developing a market woodpulp industry in Alaska. In endorsing the Alaska development the association points out that the Tongass National Forest in Southeastern Alaska contains hemlock and spruce timber sufficient to supply 800,000 tons of sulphate or sulphite woodpulp annually. Ample water power and suitable pulp mill sites are found in tidewater regions of Alaska, less than 1,000 miles from Seattle. Heretofore, Indian tribal claims have retarded development of the Alaskan forest. These claims are expected to be settled soon. Recent studies are said to indicate that the limit of the amount of market woodpulp consumers can expect from Canada has just about been reached and that imports from Europe will be less than the amount needed to provide the balance of their requirements. Thus, domestic paper and board mills depending on market pulp will have difficulty maintaining their position in the future.

Waste Paper

Paper mill activity for waste paper remains strong in all parts of the country. Floods in Michigan and Illinois temporarily prevented unloading of waste paper from railroad cars in that area, but mills continued normal operations with stocks on hand.

Quotations remain at the same high levels with mill wrappers showing strong activity at $25 per ton f.o.b. baled New York. No. 1 heavy books and magazines remain at the $40 to $45 level. No. 1 fly leaf shavings continue around $60, and extra manilas stay at $45.

Rags

Paper mills are still having difficulty obtaining new domestic white cotton shirt cuttings and are currently paying over 12.00c for whatever offerings are made. Unbleached muslins are active at the 12.00c level. Blue overalls at 7.75c are readily taken up when offerings are made. Light prints at close to 6.00c are beginning to show more action.

Repacked No. 2 whites feature a fairly steady old domestic cotton rag market at around $4. Blue overalls are steady at $3.75 f.o.b. shipping point plus dealer's commission, while miscellaneous thirds and blues stay at $2.50.

Old Rope and Bagging

Market for old rope has eased up some with jute strings nearer the $4.50 level. Foreign Manila rope still gets $6 to $7 per 100 pounds to mills f.o.b. New York. No. sisal strings are $4 to $4.50.

Demand for bagging by paper mills remains steady with offerings of No. 1 gunny taken up at the $4.50 level. Light wool tares are close to $4.75 and bright bagging at $4.25 to $4.50.

Equitable Expansion in Texas Is Nearly Completed

LONG ISLAND, N. Y.—Maurice Rosenfeld, President of the Equitable Paper Bag Company reports that construction of an extensive new addition to Equitable's large southern plant is nearing completion at Orange, Texas. The new structures, which will add 100,000 square feet of space to the present plant area, are expected to double the output of bags and multi-wall shipping sacks.

The project is under the supervision of Leonard E. Canno, vice-president of the Equitable Paper Bag Company, who is in charge of the $650,000 paper mill and bag factory expansion program, of which the new construction is a part.

In addition to the building of the new structures to take care of Equitable's rapidly growing volume of business, intensive research is being carried out at the Long Island City plant in the fields of packaging, multi-color printing, and production economy methods.

Heavy Duty Drum Pumps Feature Aro Line

BRYAN, OHIO—A new line of air-operated heavy duty drum pumps designed for the requirements of factories, contractors, and all other large volume users of motor oil and lubricants, has been developed by The Aro Equipment Corporation. These heavy constructed Aro Pumps will handle lubricants, oils, and also sound deadeners, sealing materials, paints, and many other compounds direct from original containers of 55 gallons capacity.

The use of these pumps makes the handling of materials from original drums an easier, cleaner, more convenient operation. There's no mess, no loss of material in handling, no contamination of material. They produce buying economies by permitting the purchase of materials in larger quantities. They operate at high efficiency on a minimum of compressed air.

A Better Form of Control for the Entire Alkaline Pulp-Cooking Process

AUTOMATIC DIGESTER LIQUOR MEASURING SYSTEM

In a compact, convenient, easily-installed unit, Foxboro offers you a most efficient control system for metering correct amounts of white and black liquor to the digester. By merely pushing a button, an operator can get the exact charge required, and without further attention, the liquor measuring system will be ready for the next cook. Accurate control of the total alkali content of each cook is simple this way. Improvement in the uniformity and quality of pulp naturally follows.

This cabinet control system combines the time-tested, air-bubble method of liquid level measurement with Foxboro's trouble-free Rotax electrical control. It consists of two Rotax Liquid Level Controllers for white and black liquor, together with push-button stations and signal lights. Manual valve and pump control is provided for cases of emergency.

Instruments and push-button equipment come all assembled, wired and piped . . . ready for easy connections with power, air, valves and pumps. Instrumentation in this pre-engineered cabinet form has eliminated installation headaches.

AUTOMATIC DIGESTER COOKING CONTROL SYSTEM

The packaged digester control unit pictured here automatically maintains such close control of cooking time, temperature, and relief that wasteful variations are held to new minimums. Steam, chemical and labor requirements are substantially improved.

This compact Foxboro Automatic Digester Control System consists of a Dynalog 3-point Temperature Recorder, a Digester Relief Controller and a Cooking Schedule Controller with adjustable cam-set control point.

This is the form of completely automatic control that is helping pulp manufacturers operate on record-breaking production schedules at lower cost and at improved quality standards. Similar pre-engineered control is available for sulphite processes. Write for complete details. **The Foxboro Company, 114 Neponset Avenue, Foxboro, Mass., U. S. A.** Branches in principal cities.

FOXBORO REG. U. S. PAT. OFF.

Automatic DIGESTER CONTROL

PRICES

With the elimination of price controls on paper, pulp, rags and other materials, the quotations given below once more become indicative of trends in an open market. At the moment they can be of little more, for, while some volume of business still is being done under contract at the figures given below, fluctuations representing special conditions are too varied and too frequent to permit prices to be given as representing a wholly stabilized market.

Paper

(Delivered New York)

Standard News, per ton—

Roll, contract	$84.00	@	$90.00
Sheets	103.00	"	109.00

Kraft—per cwt.—Carload Quantities Zone A, Delivered 40 lb. base weight

Superstandard Wrapping	$7.00	to	—
No. 1 Wrapping	6.50	"	6.75
Standard Wrapping	6.00	"	6.25
Standard Bag	5.75	"	6.25

Tissues—Per Ream 24x36 (480) 10 lb. Zone 1.

Wh. No. 1 Frd.	1.10	@	1.20
Wh. No. 1 M. G.	1.10	@	1.20
Wh. No. 1½	.95	@	1.10
Wh. No. 2	1.00	@	1.10
Wh. Anti-Tar.	2.25	@	3.50
Kraft Unbl.	1.15	@	1.25
Manila No. 2	.90	@	1.05

Toilet—Per Case of 100 rolls 1 M Sheets.

Unbleached	4.47	@	5.50
Bleached	6.50	"	—

Paper Towels — Per Case of 3750 Zone 1.

Wh. C. fold 11x13½	4.09	@	—
Br. Sgl. fold 10 in.	2.37	"	2.48
Br. M'tif'd 9½x14¾	3.48	"	—
Br. M'tif'd 9½x9¾	2.37	"	2.48

Manila—per cwt.—C. l. f. a.

No. 1 Jute	11.25	@	—
No. 1 Manila 35 lb.	6.00	"	7.00

Boards, per ton—

News	*75.00	@	81.50
Chip	*73.00	"	77.50
Sgl. Mla. L1 Chip	*89.00	"	92.50
White Pat. Coated	*101.50	"	110.00
Kraft Liners 42 lb.	*84.00	"	100.00
Binders Boards	94.00	"	126.00

Base Prices per 10 tons. Less than 10 tons but over 3 tons, add $2.50; three tons or less, add $5; regular 35-39 basis, add $5; basis 40-49, add $2.50; basis 91-100, add $2.50; basis 101-120, add $5

The following are representative of distributors' resale prices, all deliveries in Zone 1:

Rag Content Bonds and Ledgers—White, Assorted Items

	Bonds		Ledgers	
100% Rag Ext. No. 1	$39.75	@ $46.75	$40.90	@ $48.00
100% Rag	32.85	" 38.50	34.00	" 40.00
85% Rag	....	"	30.55	" 38.75
75% Rag	24.30	" 28.50	24.45	" 30.00
65% Rag	....	"	....	" ....
50% Rag	20.05	" 24.50	21.25	" 25.75
25% Rag	17.85	" 21.75	19.00	" 23.25

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers—White, Assorted Items

	Bonds		Ledgers	
No. 1	$12.00	@ $14.50	$13.15	@ $16.00
No. 2	11.25	" 13.75	12.25	" 15.00
No. 3	....	"	....	" ....
No. 4	10.60	" 13.00	11.75	" 14.25

Colors $1.00 cwt. extra.

Free Sheet Book Papers—White, Cased Paper

No. 1 Glossy Coated	$14.70	@	$16.75
No. 2 Glossy Coated	13.75	"	15.50
No. 3 Glossy Coated	13.20	"	16.00
No. 4 Glossy Coated	12.80	"	14.50
No. 1 Antique (Watermarked)	11.35	"	12.75
No. 2 Offset	10.65	"	12.25
A Grade E. F.	10.60	"	12.00
A Grade S. & S. C.	11.00	"	12.50
B Grade E. F.	10.30	"	11.75
B Grade S. C.	10.70	"	12.25
C Grade E. F.	10.00	"	11.50
C Grade S. C.	10.40	"	12.00
D Grade E. F.	9.70	"	11.00
D Grade S. & S. C.	10.10	"	11.50

Ivory & India at $.50 cwt. extra

Wood Pulp

Domestic mill prices delivered with former OPA freight allowances.

	Per Short ADT		
Groundwood	$75.00	to	—
Unbleached Sulphite	117.00	"	—
Bleached Sulphite	121.00	"	125.00
Bleached Soda	105.00	"	115.00
Unbleached Kraft	102.50	"	—
Southern Kraft	90.00	"	102.50

Canadian mill prices delivered with freight allowances of $7.50 per ADT; unless otherwise specified:

	Per Short ADT		
Regular Kraft	$102.50	to	—
Select Unbleached Kraft (no freight allowance)	105.00	"	—
Unbleached Sulphite	115.00	"	—
Glassine Unbleached Sulphite (no freight allowance)	102.50	"	—
Bleached Soda	105.00	"	115.00
Groundwood	75.00	"	80.00
Siderurus Pulping News	75.00	"	—
Hardwood and Specialty Grades	Nominal		

Swedish Quotations Ex. dock, New York

	Per Short ADT		
Bleached Kraft	$156.00	to	—
Bleached Sulphite	151.00	"	158.50
Unbleached Sulphite	121.00	"	131.00
Unbleached Kraft	116.00	"	126.00

Finnish Quotations Ex. dock, New York

	Per Short ADT
Bleached Sulphite	$165.00
Unbleached Sulphite	132.50
Unbleached Sulphite (special grade)	137.50
Unbleached Sulphate	132.50
Unbleached Sulphate (special grade)	159.00

Other European countries, at the present time, are not quoting on prompt and forward deliveries of wood pulp, because they have no tonnage available for export.

New Domestic Cotton Cuttings

(Prices delivered Mill Plus Dealer's Commission)

White Shirt	$11.50	to	$12.00
Light Silesias	7.50		
Unbleached Muslin	11.50	"	12.00
White Back Blue Overalls	8.25		
Blue Overalls	7.75		
Unbl. Fancy Shirt	4.50	"	5.00
Light Percales	5.50	"	6.00
Light Prints	5.25	"	5.95
Washables	4.00		
Bleachable Khaki	5.50	"	6.00
Unbleachable Khaki	5.00	"	5.50
Cottonades	4.50	"	5.00

Old Domestic Cotton Rags

F.O.B. Shipping Point Plus Dealer's Commission)

	Per 100 lbs.		
No. 1 Whites Repacked	$5.00		
No. 1 Whites Miscellaneous	4.25		
No. 2 Whites Repacked	4.00		
No. 2 Whites Miscellaneous	3.50		
Blue Overalls	3.75		
Thirds and Blues Repacked	3.00		
Thirds and Blues Miscellaneous	2.50		
No. 1 Roofing Rags	2.20		
No. 2 Roofing Rags	2.10		
No. 3 Jute Bagging	2.00		
No. 4 Brussels and hard back carpets	2.00		
No. 5A Roofing Rags	2.00		

New Foreign Cotton Cuttings

(Prices delivered Mill)

	Per 100 lbs.		
New Dark Cuttings	$6.00	to	....
New Mixed Cuttings	6.50	"	....
Light Silesias	9.00	"	10.00
Light Flannelettes	8.00	"	9.00
New White Cuttings	13.00	"	15.00
Fancy Shirt Cuttings	9.00	"	10.00
Light Prints	8.00	"	10.00
Bleachable Khaki, No. 1	7.00	"	7.50
Unbl. Khaki, No. 1	6.25	"	6.75

Old Foreign Rags

(F.O.B. New York)

	Per 100 lbs.		
No. 1 White Linens	$14.00	to	16.00
No. 2 White Linens	12.00	"	13.00
No. 3 White Linens	8.00	"	9.00
No. 4 White Linens	8.00	"	9.00
No. 1 White Cottons	10.00	"	12.00
No. 2 White Cottons	8.00	"	9.00
No. 3 White Cottons	6.50	"	7.00
No. 4 White Cottons	5.00	"	5.50
Extra Light Prints	7.50	"	8.00
No. 1 New Light Prints	6.25	"	6.75
Med. Light Prints	5.25	"	5.75
Dutch Blue Cottons	5.25	"	5.50
Checks and Blues	4.00	"	4.25
Linsey Garments	4.50	"	5.00
Dark Cottons	3.75	"	4.00
Old Shopperies	3.25	"	3.50
New Shopperies	3.25	"	3.50

BAGGING

(Prices to Mill, f.o.b. N. Y.)

	Per 100 lbs.		
Foreign Gunny, No. 1	$4.75	to	5.00
Domestic Gunny, No. 1	4.25	"	4.50
Light Wool Tares	4.50	"	4.75
Heavy Wool Tares	4.75	"	5.00
Bright Bagging	4.25	"	4.50
Foreign Manila Rope	6.00	"	7.00
Domestic Manila Rope	5.75	"	....
Jute Strings	4.50	"	5.00
No. 1 Sisal Strings	4.00	"	4.50
Mixed Strings	1.75	"	....

Waste Paper

Prices to Mills

(Dollars Per Ton)

F.o.b. New York, Baled

No. 1 Hard White Envelope Cuts, one cut	$100.00	@	$120.00
No. 1 Hard White Envelope Cuts	90.00	"	100.00
No. 1 Hard White Shavings, unruled	100.00	"	110.00
No. 1 Hard White Shavings, ruled	80.00	"	90.00
Soft White Shavings, one cut	95.00	"	105.00
No. 1 Soft White Shavings	85.00	"	95.00
Soft White Shavings, Misc.	65.00	"	75.00
No. 1 Fly Leaf Shavings	55.00	"	60.00
No. 2 Fly Leaf Shavings	50.00	"	55.00
No. 1 Groundwood Fly Leaf Shavings	30.00	"	33.00
No. 2 Mixed Groundwood Fly Leaf Shavings	(nominal)		
Mixed Colored Shavings	(nominal)		
Mixed Groundwood Colored Shavings	(nominal)		
Overissue Magazines	(nominal)		
No. 1 Heavy Books & Magazines	40.00	"	45.00
Mixed Books	22.00	"	25.00
No. 1 White Ledger	70.00	"	80.00
No. 2 Mixed Ledger, colored	60.00	"	70.00
New Manila Envelope Cuttings, one cut	100.00	"	110.00
New Manila Envelope Cuttings	65.00	"	75.00
Extra Manilas	40.00	"	45.00
Mixed Kraft, Env. & Bag Cuttings	75.00	"	85.00
Kraft Envelope Cuttings	100.00	"	105.00
Triple Sorted, No. 1 Brown Soft Kraft	60.00	"	70.00
New 100% Kraft Corrugated Cuttings	70.00	"	75.00
No. 1 Assorted Old Kraft	40.00	"	50.00
New Jute Corrugated Cuttings	27.00	"	—
Old 100% Kraft Corrugated Containers	(nominal)		
No. 1 News	26.00	"	27.00
No. 1 Mixed Paper	19.00	"	21.00
Box Board Cuttings	23.00	"	—
White Blank News	75.00	"	80.00
Overissue News	(nominal)		
Old Corrugated	28.00	"	30.00
Mill Wrappers	22.00	"	25.00

Twines

All Prices Nominal (F. o. b. Mill) (Soft Fiber)

Coarse Polished—India	.26	@	.29
Fine Polished—Fine India	.31	"	.35
Unpolished—Paper Makers	.20	"	.26
Tube Rope	.22	"	.27½
Wrapping	.26	"	.33½
Cotton	.70	"	—
(Hard Fiber)			
Mex. Sisal	.21	"	.24
Manila	.33	"	—
(Hemp)			
Polished Hemp	.63	"	—

PHILADELPHIA

Domestic Rags (New)

(F.O.B. Eastern Shipping Point)

Shirt Cuttings—			
New White No. 1	.10½	@	.11
New White No. 2	nominal		
Light Silesias	.07½	"	.08
Black Silesias, soft	.06½	"	.07
New Unbleached	.10½	"	.11¼
Washable Prints	.06½	"	.07
Washable No. 1	.05	"	.05½
Blue Overall	.07½	"	.08
Cottons—According to grades—			
Washable Shredding	.03½	"	.04
Fancy Percales	.06¾	"	.07¼
New Black Soft	nominal		
Khaki Cuttings—			
Unbleachable Cotton Cuttings	.05½	"	.06
Bleachable Cotton Cuttings	.06½	"	.07
Men's Corduroy	.05½	"	.06
Ladies' Corduroy	.05	"	.05½
Cottonades	.05½	"	.06

Domestic Rags (Old)

(F.O.B. Eastern Shipping Point)

White No. 1—Repacked	4.50	"	5.00
Mixed White	4.00	"	4.25
White No. 2—Repacked	3.50	"	3.75
Thirds and Blues—Miscellaneous	2.25	"	2.50
Repacked	2.75	"	3.00
Roofing Stock—Foreign No. 1	nominal		
Domestic No. 1	2.00	"	2.05
Domestic No. 2	1.90	"	1.95
Roofing Bagging	1.90	"	1.95
Old Manila Rope	5.75	"	6.00

Bagging

(F.O.B. Eastern Shipping Point)

Gunny No. 1—Foreign	nominal		
Domestic	4.25	@	4.50
No. 1 Clean Bright—Sisal Strings	.04	"	.04½
No. 2 Clean Bright—Sisal Strings	.03	"	.03½
Sisal Jute	.02¾	"	.03
Scrap—No. 1	3.25	"	3.50
No. 2	1.75	"	1.85

For your lime slaking station . . .

PLUS PROTECTION AGAINST CORROSION

with the Dorrco Slaker

Something new has been added to the dependable Dorrco Slaker . . . additional corrosion protection below solution level . . . *where it counts.* Standard Dorrco Slaker specifications now include stainless steel for the shaft and impeller in the slaking compartment—for the entire rake and rake hanger below solution level—for the overflow trough!

These new anti-corrosion features coupled with long-wearing, easy to replace white iron tank liners and extra heavy plate construction, add up to top protection against the corrosive and abrasive conditions inherent in kraft mill lime slaking. No submerged bearings either . . . exposed to caustic solution and grit.

With corrosion factors reduced to a minimum, Dorrco Slaker maintenance costs are correspondingly low. Installation costs too, are low, for the complete, self-contained unit is simply bolted to the floor and requires no costly foundations or launders.

Dorrco Slakers are made in six standard sizes with capacities ranging from 5 to 200 tons of CaO per 24 hours. A Dorr engineer will gladly give you full information on the unit to fit your particular requirements.

For a trouble-free lime slaking station . . . The Dorrco Slaker delivers
(1) a grit-free milk of lime . . .
(2) at correct dilution for recausticizing . . .
(3) a well-washed and drained grit.

DORRCO

THE DORR COMPANY, ENGINEERS
570 LEXINGTON AVE., NEW YORK 22, N. Y.
ATLANTA • TORONTO • CHICAGO
DENVER • LOS ANGELES
RESEARCH AND TESTING LABORATORIES
WESTPORT, CONN.
SUGAR PROCESSING
PETREE & DORR DIVISION, NEW YORK 22, N. Y.
ASSOCIATES AND REPRESENTATIVES
Dorr Technical Services and Equipment Are Also Available Through Associated Companies and Representatives in the Principal Cities of the World. Names and Addresses on Request.

RESEARCH — ENGINEERING — EQUIPMENT

DORR

Wool Tares, heavy	4.00	"	4.25
New Burlap Cuttings	6.00	"	6.50

Old Papers

(F. o. b. Phila.)

Mill Prices, Baled

No. 1 Hard White Envelope Cuts, one cut	$100.00	@	$115.00
No. 1 Hard White Shavings, unruled	100.00	"	—
Soft White Shavings, one cut	90.00	"	95.00
White Blank News	60.00	"	65.00
Soft White Shavings	80.00	"	—
No. 1 White Ledger	75.00	"	80.00
Ledger, colored	60.00	"	65.00
No. 1 Heavy Books & Magazines	40.00	"	45.00
Overissue Magazines	nominal		
New Manila Envelope Cuttings	80.00	"	—
No. 1 Assorted Old Kraft	60.00	"	65.00
No. 1 Mixed Paper	20.00	"	—
Box Board Cuttings	20.00	"	—
Kraft Corrugated Cuttings	—		
	nominal		
Old Corrugated	30.00	"	35.00
Overissue News	40.00	"	—
No. 1 News	—	"	30.00

BOSTON

Old Papers

(F. o. b. Boston)

Mill Prices, Baled

No. 1 Hard White Shavings, unruled	7.00	@	8.00
No. 1 Hard White Shavings, ruled	7.00	"	8.00
Soft White Shavings, Mix	6.25	"	6.50
No. 1 Fly Leaf Shavings	1.65	"	1.80
No. 2 Fly Leaf Shavings	2.00	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Groundwood Fly Leaf Shavings	1.25	"	1.50
Mixed Colored Shavings	2.50	"	2.75
New Manila Envelope Cuts, one cut	5.00	"	5.50
Hard White Envelope Cuts, one cut	3.37½	"	—
Triple Sorted No. 1 Brown Soft Kraft	3.50	"	3.75
Mixed Kraft Env. & Bag Cuttings	3.75	"	4.00
Kraft Envelope Cuttings	3.75	"	4.00
No. 1 Heavy Books & Magazines	2.50	"	2.60
New Manila Envelope Cuts, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
White and Colored Tabulating Cards	4.25	"	4.50
Groundwood Tabulating Cards	1.35	"	—
White Blank News	1.65	"	—
No. 1 Assorted Old Kraft	3.50	"	—
No. 1 Mixed Paper	—	"	.95
Overissue News	1.50	"	1.75
Box Board Cuttings	.72½	"	—
New Corrugated Cuttings, Kraft	2.25	"	—
Old 100% Kraft Corrugated Containers	1.75	"	—
Old Corrugated Containers	1.50	"	—
Jute Corrugated Cuttings	1.07½	"	—
Paper Strings	2.25	"	2.50

Bagging

(F. o. b. Boston)

Gunny Bagging—			
Foreign	—	@	4.75
Domestic	—	"	4.75
Sisal Rope No. 1	6.00	"	—
Sisal Rope No. 2	5.50	"	—
Mixed Rope	5.25	"	—
Mixed Strings	2.00	"	2.50
Transmission Rope—			
Foreign	(nominal)		
Domestic	3.00	"	3.50
Manila Rope—			
Foreign	(nominal)		
Domestic	6.25	"	—
Soft Jute Rope	5.00	"	5.25
Jute Carpet Threads	6.00	"	—
Bleachery Burlap	8.50	"	9.00
Scrap Burlap—			
Foreign	—	"	4.75
Domestic	—	"	4.87½
South America	5.25	"	—
Wool Tares—			
Foreign	4.50	"	—
Domestic	4.50	"	—
Aust. Wool Pouches	5.00	"	5.25
New Zealand Wool Pouches	5.25	"	5.50
New Burlap Cuttings	6.00	"	6.50
Heavy Baling Bagging	5.25	"	5.75
Paper Mill Bagging	3.50	"	3.75
No. 1 Roofing Bagging	1.75	"	—

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints	.07	@	.07½
Fancy Percales	.07½	"	.08
New White No. 1	.10	"	.11
New Light Flannelettes	.08	"	.08½
Canton Flannels, Bleached	.10	"	.11
Underwear Cutters, Bleached	.10	"	.11
Underwear Cutters, Unbleached	11	"	.12
Silesias No. 1	.07	"	.08
New Black Silesias	.05	"	—
Red Cotton Cuttings	.05	"	—
Soft Unbleached	.11	"	.12
Blue Cheviots	.07½	"	.08
Fancy	.06	"	—
Washable	.05	"	—
Khaki Cuttings	.06	"	.07
O. D. Khaki	.07	"	—
Corduroy	.03½	"	—
New Canvas	.06¼	"	.06½
B. V. D. Cuttings	.10	"	.11

Domestic Rags (Old)

(F. o. b. Boston)

White No. 1—			
Repacked	3.80	@	—
Miscellaneous	3.20	"	—
White No. 2—			
Miscellaneous	2.65	"	—
Twos and Blues, Repacked	2.20	"	—
Old Blue Overalls	2.25	"	2.50
Thirds and Blues, Repacked	2.20	"	—
Miscellaneous	1.80	"	—
Black Stockings	3.50	"	4.00
Roofing Stock—			
No. 1	2.00	"	—
No. 2	1.90	"	2.00
No. 3	1.35	"	—
No. 4	1.35	"	—
No. 5, Quality A	1.35	"	—
Quality B	1.20	"	—
Quality C	.95	"	—
Old Manila Rope	6.00	"	—

Foreign Rags

(F. o. b. Boston)

Canvas	(nominal)
Dark Cottons	(nominal)
Dutch Blues	(nominal)
New Checks and Blues	(nominal)
Old Fustians	(nominal)
Old Linsey Garments	(nominal)
New Silesias	(nominal)

CHICAGO

Waste Paper

(F. o. b. Chicago)

Mill Prices, Baled

Shavings—			
No. 1 Hard White Envelope Cuts, one cut	$110.00	@	$120.00
No. 1 Hard White Shavings, unruled	105.00	"	115.00
No. 1 Soft White Shavings	80.00	"	95.00
No. 1 White Ledger	55.00	"	65.00
No. 1 Heavy Books & Magazines	40.00	"	43.00
White Blank News	43.00	"	49.00
Mixed Kraft Env. & Bag Cuttings	75.00	"	85.00
No. 1 Assorted Old Kraft	45.00	"	51.00
Overissue News	28.00	"	—
No. 1 News	25.00	"	—
No. 1 Mixed Paper	20.00	"	—
Old Corrugated	36.00	"	—
Mill Wrappers	22.00	"	—

MARKETS

BLANC FIXE—Supplies adequate to meet steady demand while deliveries remain uncertain. Pulp is currently quoted at $55 per ton, in barrels, car lots, at works; the powder is quoted at $67.50 per ton car lots.

BLEACHING POWDER—Current supplies adequate to meet most demands. Shipments somtimes delayed. Quotations are unchanged. Prices on bleaching powder range from $2.75 to $3.75 per 100 pounds.

CASEIN—Current prices on processed acid precipitated casein are reported around 32 to 36 cents per pound for domestic grades and 34 to 38c for Argentine f.o.b. shipping point.

CAUSTIC SODA—Demand far exceeds output with little relief seen for domestic or export markets. Solid caustic soda is reported at $2.50 per 100 pounds; flaked and ground offered at $2.90 to $3 per 100 pounds, car lots, at works.

CHINA CLAY—Heavy demand continues as supply remains tight. Domestic filler clay is currently $8.50 to $9 per ton, car lots. Coating clay is $12 car lot and $16 less car lot. Imported clay is $20 to $22 per ton, car lot, export warehouse; $45 less car lot for powdered.

CHLORINE—Market tight as demand continues to exceed output, stocks low. Lack of tank cars continues to hamper deliveries. Quotations unchanged. Chlorine is currently quoted at $2 to $2.25 per 100 pounds.

ROSIN—Gum rosin in drums, per 100 pounds net, in yard New York, car lots, B, D, $10.80; E, F, G, H, I, K, M, $11.80; WG, $12.05; WW, $12.05. Wood Rosin, per 100 pounds l.c.l., f.o.b. N. Y., B, $7.45; FF, $8.95; G, H, I, $10.25; WW and X, $10.45.

SALT CAKE—Demand continues to increase with supplies showing little improvement. Prices remain unchanged. Domestic salt cake is quoted at $20.00 to $24 per ton in bulk. Chrome salt cake is quoted at $16 per ton.

SODA ASH — Demand active as supplies continue short, previous orders filled. Contract orders prevail at the same high levels. Current prices, car lots, per 100 pounds, are as follows: in bulk, $1.08; in paper bags, $1.20; and in barrels, $1.60.

STARCH—Domestic demand absorbs capacity production leaving little for export. Starch prices continue strong with the pearl grade quoted at $4.67 per 100 pounds; powdered starch at $4.78 per 100 pounds, car lots, Chicago.

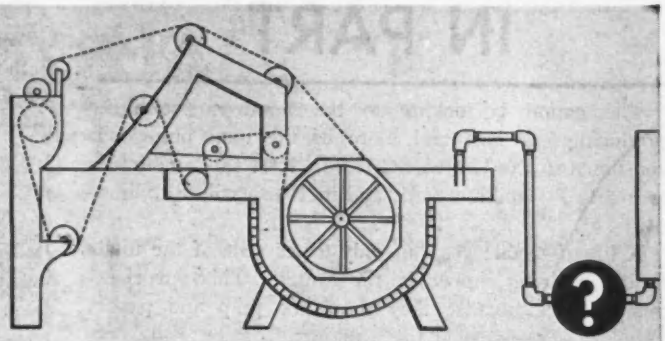
SULPHATE OF ALUMINA—Demand active, supply fair. Quotations continue unchanged. The commercial grades are quoted at from $1.15 to $1.30 per 100 pounds, in bags, car lots, f. o. b. works. Iron free is quoted at $1.95 to $2.25 per 100 pounds, in bags, at works.

SULPHUR—Plentiful supplies to meet active domestic and export demands. Annual contracts are quoted at $16 per long ton, f.o.b. mines; the price f.o.b. at Gulf Ports is $17.50 per long ton.

TALC—Domestic and French grades are moving in fair volume with prices steady. Domestic grades are currently quoted at from $16 to $30 per ton at mines; Canadian at $35 to $45 per ton. All prices in car lots.

PROBLEM: A large paper mill requires a pump for transferring white water to the save-all at a rate of 1600 G.P.M. against a total dynamic head of 55 ft.

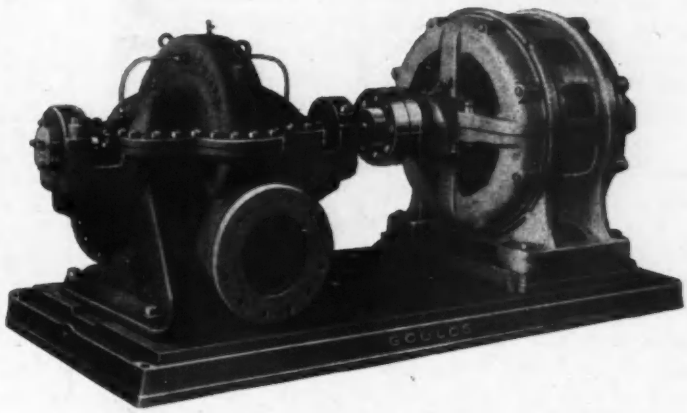
Which Goulds Pump is *the* Pump for *the* Job?



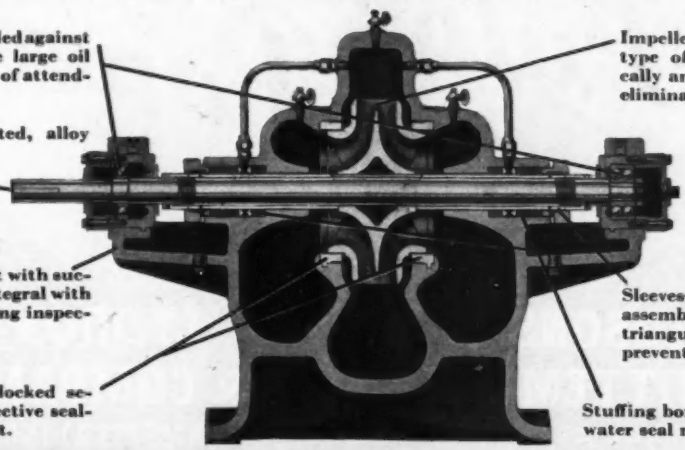
SOLUTION: GOULDS SINGLE STAGE DOUBLE-SUCTION CENTRIFUGAL

The 6″ pump with a 30 H.P. 1750 R.P.M. motor withstands long hard service with efficiency and a minimum of attention.

These pumps are furnished in sizes from 2″ to 16″ providing capacities of from 80 to 14,500 G.P.M., and heads to 500 ft. depending upon capacity. When *you* have a pump problem call or write Pump Headquarters or your nearest Goulds office.



Here's why the "Goulds Single Stage Double-Suction" *IS* EFFICIENT AND DEPENDABLE



Bearings—heavy duty, sealed against moisture and dust; have large oil reservoirs for long periods of attendance-free operation.

Shaft—heavy, heat treated, alloy steel.

Casing—horizontally split with suction and discharge cast integral with lower half of casing, making inspection easy and quick.

Wearing rings—bronze, locked securely in position for effective sealing, renewable at low cost.

Impeller—enclosed double suction type of high efficiency; hydraulically and mechanically balanced to eliminate vibration and wear.

Sleeves—heavy section bronze, easily assembled or replaced; have special triangular micarta packing ring to prevent leakage along shaft.

Stuffing boxes—extra deep with bronze water seal rings.

GOULDS

GOULDS PUMPS, INC. • SENECA FALLS, N. Y.

PUMPS, INC.

the PUMP FOR the JOB

IN PART

The nation is looking to the South to continue producing one half and more of the total pulpwood consumed in the United States. In 1944 this amounted to nearly 7½ million cords and in 1946 easily 8 million cords.

A lot of wood; yes, but only 9 per cent of the total drain on living timber in the South. This surprises many people because they think the pulp and paper industry is responsible for a majority of the wood cut from our forests.

Lumber, a forest product of tremendous importance to our ecenomy, uses 44 per cent. Fuelwood, which never makes the headlines as an essential commodity, causes a drain of 18 per cent. This is usually cut from about the same size and quality timber as pulpwood and consumes twice as much.

The people in the United States are the largest consumers of paper products in the world, averaging over 300 pounds per person per year.

Wood is the base for all this. The pulpwood industry could draw its annual supply of wood each year and every year thereafter from 20 to 25 million acres of Southern forests, as a conservative estimate, if those acres were well stocked, timber properly cut, and adequately protected from fire. There are about 167 million acres of forest land in private ownership in this territory.

Fifty per cent more wood is lost by fire, insects, disease, than is consumed by the entire pulp and paper industry in the South in one year.—H. J. MAHLSBERGER, *Forester, Southern Pulpwood Conservation Association.*

Production Ratio Report*

(Production as per cent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

Current Weeks—1947		Corresponding Weeks—1946	
March 1	108.5	March 2	101.8
March 8	104.5	March 9	103.4
March 15	107.2	March 16	104.1
March 22	105.8	March 23	105.0
March 29 (Revised)	107.8	March 30	104.9
April 5	105.2	April 6	104.1

COMPARATIVE MONTHLY SUMMARIES

1946						1947	
Jan.	94.7	May	100.7	Oct.	106.4	Jan.	102.1
Feb.	98.4	June	104.6	Nov.	105.5	Feb.	105.9
March	104.4	July	94.0	Dec.	97.0	March	*106.1*
April	102.7	August	104.7				
		Sept.	101.3	Avg.	101.1		

COMPARATIVE YEARLY SUMMARIES

	1940	1941	1942	1943	1944	1945	1946	1947
Year to Date	85.2	89.6	103.3	88.7	88.3	88.3	99.1	*105.1*
Year Average	85.6	97.4	90.4	87.8	88.1	89.4	101.1	

PAPERBOARD OPERATING RATIOS†

Current Weeks—1947		Corresponding Weeks—1946	
March 1	102	March 2	98
March 8	102	March 9	99
March 15	104	March 16	100
March 22	103	March 23	99
March 29	102	March 30	100
April 5	*102*	April 6	99

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1946	90	91	100	99	94	97	89	99	96	100	99	92	96
1947	99	103	*101*										

* Based on tonnage reported to American Paper & Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

† Per cents of operation based on "Inch-Hours" reported to the National Paperboard Association.

EDITORIAL

Tree Farming

For those who have come to regard Connecticut as a state devoted to suburban living, to brass and hardware manufacture, and to the activities of an industrialized civilization it comes as a bit of surprise that Dr. Robert Aries, who should know about its forest resources, can talk of prospects of a pulp mill in that state. And yet, to anyone who has explored the more remote sections of its boundaries, and has seen the evidence adduced by exponents of modern methods of forest management, the thought is not an idle speculation at all. Some specific examples of profitably conservative operations were cited lately by another exponent of sound management, when Chapin Collins, managing director of the American Forest Products Industries, placed them before the National Chemurgic Council, meeting in Columbus, Ohio.

In Pennsylvania the first certified tree farm there will be on land owned by a paper company which has been in business in one spot for 100 years. Most of its wood comes from farm woodlots. That company not only buys wood, but it constantly is helping improve forestry practiced by those who sell this wood. It intends to be in business there another 100 years.

In 1852, a family of lumbermen in Maine loaded a sawmill on a sailing ship and took it around the Horn. The mill was set up on Puget Sound. The same company is sawing lumber in the same place today. Thousands of acres of its cutover lands, now growing a new crop of trees, are being set up as a tree farm.

Nature, it appears, is always willing to be helpful to those who help themselves.

Customer Relations

Considerable interest and a good deal of future good will for their segment of the industry is packed into a series of discussion subjects that has been drawn up by the Chicago group of the Salesmens Association of the Pulp and Paper Industry. The whole program was summarized by one who explained it as an examination of what the customer thinks about us, and what we are doing, or can do about it.

The theme is of particular timeliness just now when so many customers, yielding to pressures on their staffs from further along the line, are finding eager ears always ready to listen to anybody who complains about anything. Committee hearings of recent weeks in Washington have concerned themselves with one phase of customer complaint, and if they did nothing else they brought out sharply the fact that the paper industry, as an industry, has been moving heaven and earth to supply an inflated demand. The industrial purchasing agent, as summarized in the news of the week or another page, is turning his attention from the shortage of supply, and, as might be expected, is examining what he gets for what he pays. Even the financial page writer, with his attention focussed always on earnings, has added the emphasis of his headlines to adjustments in prices by some mills. One writer speaks of the "unfortunate timing" of a recent advance in newsprint prices by some Canadian sources.

Actually, Canadian sources have been most heedful of this long-term customer relations. In the face of considerably higher prices they have done a heroic job of pushing existing equipment to a point far beyond its rated capacity. Avoidance of anything like boom building, while it may fail to please those who would have a glutted supply, there is every reason to believe that the industry is keeping on a sound basis.

R. M. Fowler points out, that world consumption in 1937 was estimated at 8,875,000 tons of newsprint. This compares with present estimated capacity of 9,800,000 tons.

"On the basis of consumption trends prior to 1937," Mr. Fowler says, "this potential margin of 1,000,000 tons would seem sufficient to take care of normal consumption increases well beyond 1950. Whether or not prewar the consumption trend has been permanently altered throughout the world remains to be seen."

Mr. Fowler believes that present shortages will be eased by additional capacity of existing mills long before new mills could be brought into production. At least two or three years would be needed for the completion of such mills, and many newsprint makers feel that by that time, a more normal demand-supply situation will exist.

No Cooperation

Now that it has advanced proudly from its familiar but lowly origin through successive stages of renown into the ranks of best seller among books and highly publicized subject of exploitation in the movies the egg appears to have grown swollen with its newly achieved prominence. Or it may be that the hen has decided to increase the value of a commodity on which prices have grown, along with those of other foods. Whatever the speculative cause, we are assured that a minor crisis has been precipitated in that portion of the pulp and paper industry which has concentrated a good deal of thought and skill on the development of a product to carry eggs safely. The hens, it appears, are laying bigger eggs than they used to lay, thereby rendering obsolete machinery which had been built to carry the prewar size, and calling for the manufacture of new patterns to fit the larger post war egg.

W. L. Cook EDITOR

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122 E. 42nd ST., NEW YORK 17, N. Y. Edited By R. G. MACDONALD, Secretary

Fibrous Raw Materials Committee Report—1946*

By John Traquair[1]

The function of the TAPPI Fibrous Raw Materials Committee is to report on the general situation in the supply of fibrous raw materials. This includes all the factors entering into the production of these materials and such information regarding these factors as would be of general interest.

The first complete postwar year was full of changes, controls being gradually relaxed and finally eliminated. These changes contributed little to produce sufficient wood and wood pulp to meet the demands of paper mills. This has brought forth the realization that the demands of two world wars has seriously depleted available reserves which Nature has spent decades in building up. The cost of pulpwood required to produce a ton of pulp has increased during the war period from 100 to 150%—a range of price increase comparable with many other products.

Wood and Wood Pulp

The labor situation was critical but improved during the year. Mechanization of woods operation was greatly extended and the relumbering of cut-over areas on the West Coast reported an average of 20% additional wood being recovered.

The TAPPI Fall Meeting at Detroit was entirely devoted to the wood situation in the United States and Canada as it relates to the pulp and paper industry. The American Forest Congress recently issued a forest resource appraisal. Thus the situation has been so thoroughly covered that this year's report is devoted to fibers other than wood.

Other Fibers

Papermaking Rags

Many of the rags now being offered for papermaking are presenting new problems to the papermaker. Synthetic fibers alone and in combination with cotton are being used in many types of textiles. Viscose, cuprammonium, cellulose acetate, nylon, vinyon, saran, etc. fibers are appearing in many fabrics and their uses are increasing. These fibers are very hard to identify and offer new problems in processing for papermaking.

The new synthetic resins such as the vinyl resins, acrylates, urea and melamine resins, permanent water repellants of the zelan type, flameproofing agents and rubber type adhesives are becoming popular for textile finishing. These are most objectionable since they cannot be removed by ordinary rag processing procedures.

The papermaker has turned to the use of lint cotton as an alternative for rags with fairly successful results. In fact, raw cotton is now an integral part of most rag furnishes and the wide adoption of raw cotton has been in a good measure responsible for the increased tonnage of cotton content paper during the past year. Cotton linters in any form became scarce during the last quarter of 1946, prepared sheet linters being practically unobtainable. This necessitated the use of raw first- and second-cut linters which were of necessity purified at the mill. The high cost of all linters is common knowledge.

Studies are being made as to the feasibility of growing a medium staple cotton for papermaking use exclusively. The idea is feasible and appears to be practical and economical.

Regarding rags used for roofing and saturating papers, the use of Asplund or similar wood fibers has cut down the proportion of rags used and has eased the supply problem for mills making this grade of product.

Hard Fiber Wastes

Rope, twine, jute, sisal, manila, hemp—all of the type of fibers used for strong papers, have been scarce and of poor quality. As with rags, the same difficulties are experienced in using hard fiber wastes —such as army surplus, awnings, tarpaulins, etc., which have received some waterproofing or other chemical treatment. Such products require special cleaning treatments to make them useful for papermaking.

As to hard fibers of foreign origin, sisal in cordage or other form became scarce in the latter part of 1946 with some increase in the supply of manila hemp cordage and new fiber (with allocation) for papermaking purposes. New Batido (beaten) grade caroa fiber from Brazil has continued to be available in limited quantities with very small amounts of caroa bagging and strings being available. The East Indian hemps have been very scarce because of export re-

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strictions. A limited and temporary supply of camouflage netting made from Benares hemp was available during the year.

Straw and Agricultural Residues

These are covered by another committee *(6)*, the work being concentrated at the Northern Regional Research Laboratory, Peoria, Illinois. The raw material situation is under investigation by this group, especially the cost of collection, quality, and other economic factors. Cereal straw is one of the most plentiful raw materials, but the standard of quality, so far, makes it suitable only for straw board; no bleached straw pulp is made in the United States.

In this respect American practice seems somewhat backward when the papers being produced from cereal straws in some of the European mills are examined. In Britain previous to the late war, practically no straw was used as esparto from North Africa provided a raw material from which the finest pulp and paper could be made, but with imports cut off during the war, the British papermakers turned to straw as the most abundant available raw material. The chairman of one of the larger British companies stated recently that "if the controlled price of straw to the paper mills was reduced to a reasonable amount (at present approximately $25.00 per ton delivered), I believe British straw would become a principal permanent raw material for conversion into pulp and thus drastically reduce the very large prewar imports of pulp into this country."

During the three years, 1943, 1944, 1945, the consumption of straw in Britain averaged 300,000 tons per year. In 1946, esparto consumption went to over 100,000 tons and Scandinavian wood pulp again being available, the consumption of straw dropped to around 150,000 tons.

Flax

Flax fiber in the form of linen rags was the prized raw material for early handmade fine papers; they still are, but the quantity available is limited and its use restricted to high grade bonds, special tissues, cigarette papers, etc. Fiber flax, before the invention of the cotton gin, was commonly used to make household goods and clothing throughout the American colonies. Each farmer had a few acres of flax and spinning and weaving were home industries as they still are in some parts of Europe.

"Purple and fine linen" has meant quality since Biblical times and although flax of a kind will grow almost anywhere in the United States, dependence is placed on imports for all fine linen and much of the coarser grades. (See Textile Foundation Report *(1)*.)

There are two varieties of the flax plant—one raised primarily for fiber and the other for seed: the main difference being the method of cultivation. Seed flax, as a source of linseed oil, lacks the antiquity of linen. The first record of flax being raised in the United States was in 1719 in New Hampshire by Scotch-Irish immigrants. The first linseed oil mills were built in New York State and Pennsylvania. By 1870, the domestic crop had reached 3 to 5 million bushels annually and had moved west centering around Dayton, Ohio. Some years later, the crop had moved as far west as Iowa and Minnesota on its way to the plains of the Dakotas and Montana.

This westward move was necessary on account of "flax wilt," a disease which developed when flax was repeatedly grown on the same soil. Now there are no frontiers and the development of resistant types and improved and better seed yielding strains is the work of the Flax Institute and the U. S. Department of Agriculture, in conjunction with several of the agricultural colleges *(5)*.

During the last 25 years, extensive research has been carried on regarding the best method of preparing seed flax straw for pulping. It is first decorticated to get rid of most of the shive, chaff, etc., and for best results, the straw must be dry containing not more than 10% moisture. The yield of flax tow varies from 10 to 20% and is baled and shipped to the pulp and paper mills as their raw material.

Of course, much flax tow is used for other purposes, such as upholstery, coarse twine, etc. The shive is usually burnt although heavy boards can be made from it when it is used with other fibrous material.

The chemical process is usually some variation of the kraft process with concentration of the chemicals being maintained during the cook. Globe digesters generally are used. In some mills a double cook is used, the liquor from the final cook being used for the preliminary cook. Technical improvements are being made and flax pulp is taking its place with other pulps as a standard fibrous raw material. This is a notable achievement and points the way for the development and commercial use of other agricultural residues. It has been a long up-hill struggle aided to final success by the necessity of finding additional supplies of suitable raw material for fine papers of the cigarete class and similar grades when the usual supply was cut off during the late war period. *(3, 4, 5)*.

Canes and Grasses

Sugar Cane Bagasse

The canes are all somewhat similar in general characteristics, sugar cane being the only one that has a solid core, the other canes are hollow. It is the only one which is presently collected and is available as bagasse at sugar mills. Sugar cane bagasse has found a large outlet in the manufacture of insulating and other boards, such as Celotex. Although numerous investigations have been made and plans projected for further use of bagasse, no other large scale use in the paper or paper board industry has been developed. The reason for this is that bagasse yields a pulp consisting roughly of half fibers and half pith cells. This pulp dries to a resistant sheet which does not make down easily in water. Owing to the fact that the fibers and the pith differ tremendously in physical characteristics, it is very easy to fractionate the bagasse into two fractions, one consisting of a fibrous pulp about equal in quality to hardwood soda. The pith fraction however, which can be collected on a vacuum filter, dries to a hard horny mass and can only be used in admixture with other pulps to impart to them stiffness and rattle. The problem is that two mills would have to be built to utilize bagasse and canes to best advantage; one mill to produce the cane pulp, and another to make a fibrous pulp, such as pine kraft, with which 25 to 50% of the bagasse pith could be mixed to impart certain desired characteristics *(7)*.

Bamboo

Bamboo is used largely in India for making papers of all kinds. Some very excellent pulp has been made in this country from South Carolina-grown bamboo but only in pilot plant operation as there is not enough bamboo being grown in the States to keep a large paper mill going for more than a day or two *(8, 9, 10)*.

Donax Cane

This is a wild cane of Italian origin and is found growing mainly in the Mississippi Delta region. In the middle 30's, Mussolini in conjunction with the Italian viscose interests, was responsible for the building of a large mill at Torviscosa close to the delta of the Po River. The Italian pulp industry had concentrated its efforts on the use of straw, arundo donax, broom, esparto, sorghum, and similar materials as most of the wood utilized had to be imported. This plant was entirely based on the cultivation and utilization of arundo donax cane. The original program of 30,000 tons of dissolving pulp for the first year of operation, 1939, was raised to double this in 1940, the output originally planned. The entire town and plantation of the raw material are situated on previously swampy wastelands similar to that to be found in the Mississippi Delta. Here is a case of the cellulose being grown close to the mill where it is to be used. Louisiana-grown donax cane was used in pilot plant operation at the Herty Foundation Laboratory at Savannah, Georgia, with excellent results. It is easily cooked by the kraft process and has a much finer bast fiber than sugar cane bagasse. The proportion of bast fibre to pith is about 50/50 for an average cook.

The value of vegetable fiber plants for papermaking is determined by the quantity and quality of the cellulose fibers obtainable, and the ease with which they can be isolated and purified. The aim of the papermaker is to obtain a maximum yield of cellulose at minimum cost. The trend in the industry is towards controlling the sources of raw material and thus paper mills are acquiring more and more forest land, practicing up-to-date forestry so that they can be assured of a permanent supply of raw material. It means quite a large investment. It is evident that fast-growing canes in a suitable location will produce several times as much cellulose per acre per year as the best southern pines. With a suitable site a pulp and paper mill could grow the necessary raw materials within a radius of a few miles. In the last few years, the pulp and paper manufacturers have been forced to use unfamiliar and in most cases inferior raw material. This has prompted a continuous search for suitable fibrous raw materials which could be developed in quantity and delivered to mills at competitive or lower costs.

Ramie

This is possibly the oldest and the newest textile fiber. It was known as a source of textile fiber before the early Egyptian dynasties and since that time has been rediscovered periodically. Ramie is a native of the Orient, where it has been cultivated for many years.

It belongs to the nettle family *Urtica*. It is a perennial plant growing to a height of from 3 to 6 ft. sending up numerous straight stalks, ¼ to ½-inch in diameter. The leaves of *Urtica wilis*, the most important variety, are white under-leaf and can be cut off as "tops," dried and used as a cattle food as they carry about 20% protein.

The fiber obtained after decortication of the stems has unusual qualities—great strength, luster, resistance to wear, stronger wet than dry, etc.

It requires good soil and a warm climate and has been successfully grown in the Gulf States coast region and Florida. For years quantities of "China Grass," a crude ramie obtained by hand decortication have been imported. Within recent years large plantations have been made in southern Florida black lands and by means of mechanical farm operation and improved decortication techniques, the three normal crops per year have enabled yields to be obtained which may put it into the class of a competing textile fiber. These yields are 1 ton per acre per year crude grass from 3 crops. This becomes 1600 pounds of half stock and about 1200 pounds purified fiber and 1000 pounds textile fiber. While this looks like a very low yield, it is fully double that obtained from an acre of cotton.

The latest development is growing ramie for high grade paper, cigarette, etc. A larger yield is anticipated for paper stocks instead of textile fiber and the mill preparation of the dried decorticated fibrous stock much simplified.

This year an additional 9000 acres are being developed for ramie planting in the glades land of the Hillsboro plantation, the project being approved by the Everglades Drainage Board *(11, 12)*.

Other Annual Plants

It may be that in no distant future the pulp and paper industry will grow much of its own raw material and rely less on slow growing woods and more on fast growing annual plants.

The list is very large and many factors have to be considered. It would serve no good purpose to merely mention them, but a recent one as an example —yawa fiber deserves notice and reference is made to: "The Paper Making Properties of Yawa Fiber" by Lewis G. S. Hebbs and E. L. Hill—*The Paper Maker and British Paper Trade Journal*— Oct. 1946. P. 28 T. S. — Vol. CXIII No. 4. This is a very complete paper giving details of cooks and mill trials and comparisons with manila fiber and full physical tests etc. It can be considered a substitute for manila—sometimes better. Yawa *(Vigna sinensis var. textilis)* a variety of the common cow pea is cultivated principally in Nigeria. The fiber obtained from it is employed by the natives for making ropes, twines, and more particularly, fishing nets. After the peas are harvested the dry stalks are hand stripped as the fiber strands are located on the outside of the stalks. The resulting yawa fiber is in the form of pale straw colored ribbons up to ¼ inch in width and up to 3 feet in length. It is clean, free from extraneous material and superficially somewhat resembes "raffia" in appearance.

Waste Paper

The most important of all auxiliary raw materials is waste paper, as, according to the Department of Commerce, the total consumption in 1946 established a record of over 7 million tons and 1947 will show a larger consumption, barring a serious upset in paper production. All are familiar with the industry sponsored wartime drives and waste paper collectors are adopting more cooperative methods of improving waste paper collection—baling, grading, storing etc. A few notes on one grade of waste paper, namely books and magazines, are illustrative of conditions in many other grades.

Books and Magazines

The specifications under which books and magazines are being shipped to the book paper mills today permit much greater latitude with respect to groundwood than prevailed prior to the war. At that time the specification on books and magazines was 2% tare and 2% outthrow, the latter consisting principally of groundwood. Under O. P. A. new specifications were written from time to time until

the word "groundwood" was eliminated from the definition of books and magazines entirely with the exception of newspapers and so-called "pulp" magazines. Under these specifications, such magazines as "Life", "Time", "Newsweek", etc., were permitted in the No. 1 book packing, whereas prior to the war, books of this kind were not permitted. The result of this change in specifications is that the book paper mills who deink books and magazines are consuming a substantially greater amount of groundwood than heretofore. This has provided a greater market from which the book mills can draw their supplies.

Strangely enough, this heavy consumption of magazines which contain substantial quantities of groundwood has not interfered too greatly with the quality of the finished sheet of paper, and it is safe to say that magazines which were formerly excluded will now be taken regularly for deinking. This situation should contribute very substantially to the preservation of virgin fiber. In other words, under normal conditions, book paper mills can operate with less new pulp than formerly by supplementing the latter with reclaimed fiber through the deinking process.

The book paper mills have had a very difficult time during the war period, and even subsequently, with wet strength paper in No. 1 books and magazines. This was because the packer or grader of waste paper was unable to identify the wet strength paper by reason of the fact that no tests were made available to him by the chemical industry. As a result, much of this type of paper was included in ledger, both white and colored. This particular type of paper caused no end of trouble to the book paper mills because it could not be processed with the same system which was used on ordinary book and magazine papers. Some mills were able to develop a special process for handling this wet strength waste and were successful in recovering the fiber. In recent months, a great deal of this type of waste has disappeared and the situation seems to be under better control.

Since price control was removed, the paper industry like many other industries has suffered through inflationary prices due entirely to the shortage of woodpulp. As of Jan. 15, 1947, the situation is that the Swedish mills have not announced their prices for the American market for the year 1947. Neither have they indicated what tonnage may be shipped to this country during 1947. Prior to the war, Sweden shipped from 1 million to 1.5 million tons of chemical pulp to the United States market, approximately one-half of which was kraft and one-half sulphite pulp. Today, it is estimated that Sweden may ship 500,000 tons to this market in 1947, approximately 50% of which will be kraft and 50% sulphite. This places a terrific premium on all grades of waste paper.

Under the O. P. A. ceilings, No. 1 books and magazines were sold at $38.50 per ton FOB shipping point. Today, the same product is selling at $50.00 per ton FOB shipping point. Hard white envelope cuttings and hard white shavings which were sold at $67.50 under O. P. A. ceilings FOB shipping point are now selling as high as $150.00 per ton FOB shipping point. These fantastic prices, particularly in the hard grades of waste paper, are due in most part to the difficulty which the smaller mills have found in obtaining sulphite pulp. This applies particularly to tissue mills and mills that are engaged in the manufacture of specialties. These smaller units are apparently able to market their special products based on the high cost of their raw materials to much better advantage than the larger mills which are furnishing the merchant trade or which may be engaged in publication business. In other words, these special grades appear to command prices beyond anything which could be established in the larger units of the industry.

From the above observations, it can be deduced that there is a far greater amount of waste paper which is utilized today than ever before in paper mills, and if it were not for the fact that the specifications, insofar as groundwood papers are concerned, had not been modified, it is difficult to see how the paper mills engaged in the deinking of waste paper could have procured their requirements. Consequently, where formerly waste paper was more or less a drug on the market and commanded a very modest price which enabled paper mills to manufacture at low cost, it appears that this particular product has not only found its proper price level with respect to the value of the fiber, but has gone far beyond that, due to the scarcity of sulphite pulp.

The chairman wishes to thank the other members of the Fibrous Raw Materials Committee for their contributions to this report.

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The Chemical Senses

John Wiley & Sons have recently published an interesting book entitled "The Chemical Senses" by R. W. Moncrieff (432 pp. 5⅝ x 8¾). This subject is of interest to the paper industry because of its current effort to develop packaging papers.

The author has brought together a wealth of previously unobtainable information on the chemical aspects of taste, smell and the common chemical sense. There is an extensive glossary, bibliography, and author and subject index as well as many illustrations.

Among the subjects treated are flavor and food, theories and classifications of odors, taste and constitution, gustation, olefaction, and structure of the chemical sense organs and their connections.

Copies may be obtained from the Book Department of the Technical Association of the Pulp and Paper Industry, 122 East 42nd Street, New York 17, N. Y. at $4.50 per copy.

Effect of Combined Straw on New Seedings*

By C. J. Willard[1] and R. D. Lewis[2]

Abstract

In observations and experiments since 1938, permitting wheat straw to remain on the field as the combine left it has reduced the stand of legumes and the yield of legume hay the next season, the reduction being more or less proportional to the amount of straw present above 1 ton per acre. This loss was caused in part to mechanical shading out, but more to the death, during the fall and winter, of plants that had made a good growth through the straw. This was apparently caused by diseases similar to "damping off," but no plant pathological studies have been made.

In all comparisons of methods of handling combined straw, the best stands of clover and alfalfa have been obtained by cutting the stubble immediately after combining and removing all material at once. With this method as 100%, the yield of clean hay after leaving the straw untouched has averaged just 50% for the two recent years of the test. Cutting and taking all material off a month after combining yielded 95%. Cutting at once after combining and letting the material remain averaged 86% and removing the combined straw at once, with or without clipping in late August, 90 to 95%.

The recommendations below are based on these tests and many earlier observations:

1. For dairy and other livestock farms—Cut combined stubble at normal hay height as soon as combining is completed; remove all straw and stubble for bedding. If less bedding is required than this will make, either remove the loose combined straw and clip later, or cut all just after harvest, and leave on the ground what is not wanted.

2. For grain farms—Remove the loose combined straw only, or cut the stubble just after harvest and remove everything, or cut the stubble just after harvest and leave everything on the ground. If the potash and phosphate which are removed are returned, there can be no objection to selling straw which, if left untouched after combining, seriously endangers the most important soil-building crops. The organic matter left in the soil after these methods of treatment will be essentially proportional to the hay yields.

Organic matter is the life of the soil. In general, farming systems have depleted and are depleting the soils of their original stock of organic matter, and do not provide sufficiently for its replacement. This results in a long series of ills with low yields and impoverished farms at the end. Because of these conditions, agronomists must look critically at any system which removes organic matter from the land, instead of returning it to the soil.

The utilization of the so-called wastes of agriculture, the straw, stover, and other residues left from harvesting grain and other products has long been an object of commercial concern, especially of the "chemurgic" group. These wastes are also the object of agronomic concern for a different reason — to discover how best to incorporate this organic matter into the soil with maximum crop-producing benefits. There is apparent conflict between these interests, and in many instances the crop-producing value of the wastes is greater than the commercial value.

However, it is the purpose of this paper to describe one situation in which there is less conflict between the agronomists' recommendations and commercial needs. In Ohio, and similarly but to a less extent as one goes west, the main object of growing small grain, either wheat or oats, is to have a place to sow clover, alfalfa, and other soil-building forage crops, or, to state it in another way, to obtain some return from the land in the year the land is seeded down to forage. In Ohio there are few acres of wheat or oats which are not seeded to some forage: as one goes west, the small grains become more important for themselves, and less important as companion crops, but they are important as companion crops to and slightly beyond the Missouri River.

These forages — alfalfa, clover, and grasses — are the only soil-building crops in the rotation. Corn, soybeans, oats, wheat, all, by their culture, destroy the organic matter in the soil and reduce its productivity. Only the deep-rooted biennial and perennial forages build up the soil. Anything, therefore, which results in a failure of the forage seeding, changes the rotation to a soil-depleting one.

The combined harvester-thresher became important in Ohio in the late 1930's. About 1500 combines were used in the state in 1936, about 3500 in 1937, 6000 in 1938, and nearly 10,000 in 1939. At the present time, much the larger proportion of the wheat in Ohio is combined and a considerable proportion of the oats and other small grains.

Effect of Straw Left on Field

Since the combine leaves the straw in the field on top of the new seedings, it was evident that the combine might be quite different from previous methods of harvesting wheat in its effects on the seeding. A number of preliminary tests from 1937 to 1942 indicated in every instance that if the combined straw

FIG. 1

May 30, 1946. Treatment 1, plot left untreated after combining, looking across the direction of combining

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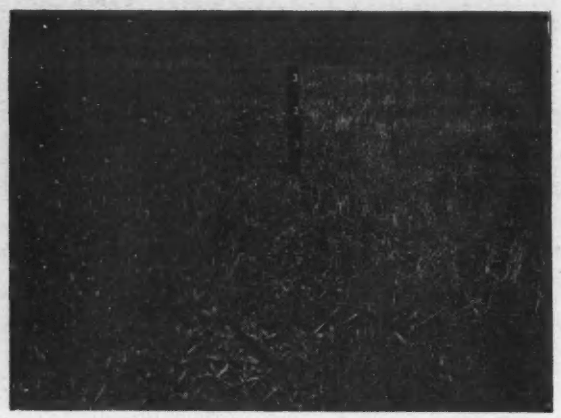


FIG. 2

April 7, 1946. Left, treatment 5, stubble cut short and everything removed at once after combining; right, treatment 1, nothing done after combining. Figs. 5, 4 and 2 are successive views from the same point.

was left on the field without treatment, the stand and yields of forages was decreased, sometimes seriously. A project to obtain more complete data was begun in 1942. Wheat was sown on a block 825 by 75 feet, and a mixture of alfalfa 7 pounds per acre and red clover 5 pounds per acre, sown on the wheat the following March.

No stands of legumes were obtained in 1944. Excellent stands were obtained in 1943 and 1945. After combining the block, the treatments indicated in Table I were laid out in duplicate (treatment 1 in quadruplicate) across the block, making plots 40 by 75 feet. In 1943, due to a series of delays, the wheat was not combined until August 15, so treatments 3, 6, 7, 8, and 9 had to be omitted. The test was carried out in full and with unusual success in 1945. The data obtained are given in Table I.

TABLE I.—TREATMENT OF COMBINED STRAW
Columbus, 1944 and 1946

Treatment After Combining 1943 and 1945	Year of Harvest	Yield per Acre as Raked, lb.	Straw in Hay as Raked, %	Yield per Acre Clean Hay, lb.	Yield per Acre 2nd Cutting, lb.	Total Yield Clean Hay, lb.	Yield as Per Cent of No. 5, %
1. Nothing done after combining.	1944	2100	13.2	1820	....	1820	62
	1946	2910	48.2	1510	530	2040	38
2. Combined straw raked and removed at once after combining.	1944	3000	2.7	2920	....	2920	100
	1946	3380	8.5	3100	1100	4210	79
3. Combined straw removed at once after combining, clipped in late August.	1946	3520	0.1	3510	1560	5070	95
4. Mowed at once after combining. Straw, hay and stubble left.	1944	2730	5.0	2590	....	2590	88
	1946	3370	6.6	3150	1340	4490	84
5. Mowed at once after combining. All material taken off.	1944	2940	0.4	2930	....	2930	100
	1946	3650	0.2	3640	1710	5350	100
6. Mowed at once after combining. All material taken off. Mowed again late August. Hay not removed.	1946	2960	1.2	2930	1460	4390	82
7. Combined straw removed 1 month after combining. Nothing else done.	1946	4190	10.7	3740	920	4660	87
8. Mowed 1 month after combining. All material removed.	1946	3390	00.0	3390	1670	5060	95
9. Mowed 1 month after combining. Straw, hay, and stubble left.	1946	4090	31.3*	2810	1440	4250	80

* The per cent of straw was obtained by sorting small samples. This plot was very uneven and hard to sample. Field observation suggests that this figure is much too high.

The plots on which nothing was done to the straw were very poor in 1944 and hardly worth harvesting in 1946 (Figs. 1 and 2). Only one untreated plot had even a reasonable stand in 1946, and this plot was on the highest, poorest land in the range, where the straw in 1945 was very light. The first impression is that the thinning of these stands was due to shading by the combined straw, which was left somewhat in windrows. Figure 3 suggests this. However, death by shading would have occurred before August 17 in 1945. On that date there was (Fig. 4) a vigorous growth of clover and alfalfa through all but the very heaviest bunches of straw—a great contrast to its appearance just after combining (Fig. 5). Undoubtedly smothering from shading is one factor in the injurious effect of combined straw, but it is not the only factor, nor apparently the most important one. Treatments 7 and 8, in which the combined straw was removed a month after combining, both gave excellent results compared to treatment 1.

FIG. 3

May 30, 1946. Treatment 1, plot left untreated after combining in 1945, looking parallel with the direction of combining

While careful studies by plant pathologists over a series of years would be necessary to determine exactly what happens, the authors' observations very strongly suggest that the presence of the combined straw encourages the development of diseases similar to "damping off" in the clover and alfalfa stands.

This idea is borne out by experiences in using mulches in obtaining stands of legumes in summer seeding. A light mulch of manure or straw has been quite favorable to the establishment of forages (Fig. 6). Heavy mulches, even though good initial stands were obtained under them, have invariably resulted in poor stands the following spring. In the work in mulching summer seedings, 1, 2, and 3 tons of straw per acre were used, and anything over 1 ton per acre proved injurious.

There has been an appreciable amount of stubble in the hay from treatments 2 (Fig. 7) and 7, but the stands and net yields have been excellent. There is reason to believe that the low yield indicated in 1946 for treatment 2 was due in part to the location of the plot in a highly nonuniform range.

The treatments of most interest to the paper industry, of course, are those in which the straw is removed. Most of the baled straw from farms is obtained by simply raking and baling the combined

straw (treatment 2). Unfortunately, yields of straw were not taken in this experiment because of wartime shortages of help, but clearly, treatment 5 (Fig. 5), in which the stubble is cut first, would yield more straw, and straw containing a higher percentage of fiber, than treatment 2 (Fig. 8), since the basal part of the straw is always more fibrous than the top of the straw.

It is of special importance to the strawboard industry that, *when legumes have been seeded in the small grain,* the method of handling the straw which gets the most and best straw for the industry is also best for the seedings of these soil-building legumes. Hence, it is desirable for the farmer to sell this straw, *provided:*

1. He buys and returns to the land carriers of phosphorous and potash sufficient to replace the large amounts of these elements sold in the straw.

2. The price received compensates him for this fertility and the labor and expense of removing the straw, baling, and hauling it.

Livestock farmers, of course, are not usually going to sell straw for manufacturing. They need all the straw they can obtain for bedding. But for the grain farmer, or one who has so little livestock that he does not need much bedding, one other point may be worth emphasizing. Treatments 4 and 9, which are the alternative to baling and selling the straw, while they leave a lot of straw *on the soil,* do not put much organic matter *in the soil.* Note in Table I that hay from treatment 4 contained only 5 to 6% of straw, or 135 to 205 pounds per acre. This is all that remains of the 1 to 2 tons or more of straw that was on the land the year before. Since only a small fraction of the organic matter in straw is water-soluble, and only the water-soluble portion of the straw could have been added to the soil, the great bulk of the straw must have decayed on the surface. The organic matter is almost as completely burned and lost as if a match had been set to it *(1).* However, the minerals in the straw are conserved to the soil in treatment 4.

Summary and Conclusions

1. Leaving combined wheat straw without treatment has always injured the stand and reduced the yield and quality of the hay. The injury has been more or less proportional to the amount of straw over 1 ton per acre. Compared to cutting at once after combining and removing all material, leaving wheat straw after combining on seedings of alfalfa-clover mixtures resulted in a reduction in the yield of clean hay of 38% in 1944 and 62% in 1946.

FIG. 5

July 21, 1945. Left, treatment 5, stubble cut short and everything taken off; right, treatment 1, as combine left the straw. (Taken from the same point as Figs. 2 and 4)

2. This loss of stand is partially due to the direct shading of the young stands by the heavy straw. However, a much higher proportion of the stand disappears between September 1 and March 1, after making an apparently healthy growth for a month to

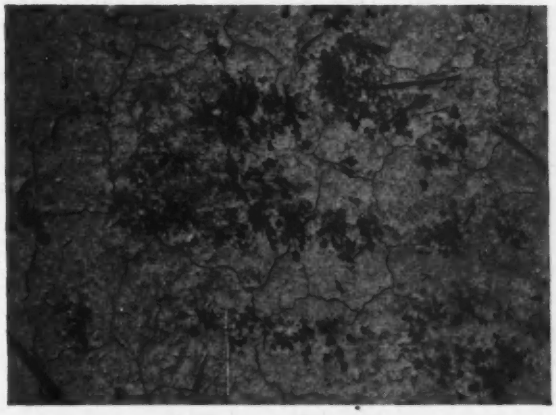


FIG. 4

August 17, 1946. Left, treatment 5, stubble cut short and everything removed on July 14; right, treatment 1, nothing done after combining. Note that clover has grown well through the combined straw. (Taken from the same point as Figs. 2 and 5)

FIG. 6

Summer seeding of alfalfa-clover mixture. Top, no straw mulch; bottom, mulched with 1 ton straw per acre.

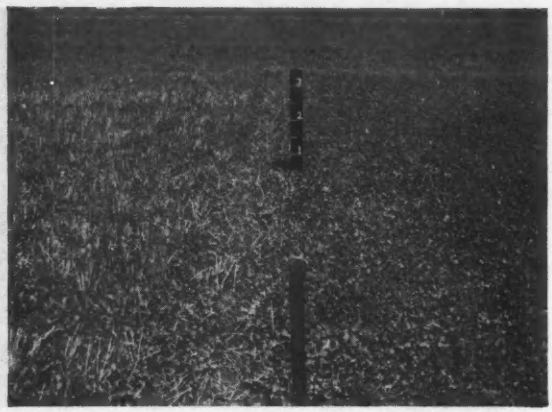


FIG. 7

April 7, 1946. Left, treatment 2, combined straw removed at once after combining in 1945. Note large amount (about ¾ ton) of unharvested stubble still standing, destined to become foreign material in the hay. Right, stubble clipped in 1945 (treatment 3).

6 weeks after combining. This dying out appears to be due to diseases favored by the heavy straw, but this has not been verified.

3. Where the small grain is used as a companion crop for legumes, and bedding is not required on the farm, cutting, baling, and selling the entire bulk of straw after combining small grain will add to, rather than decrease, the soil-building value of the rotation, provided the mineral elements removed are purchased and returned. This is because of the much better stand and yield of soil-building legumes obtained when the straw is removed. The roots of these legumes add more organic matter and nitrogen to the soil than is removed in the straw, and most of the organic matter in the straw is lost to the soil in ordinary methods of handling.

4. In all cutting or clipping of new seedings, the stand should be cut low, except where sweetclover is the crop. Alfalfa and red clover recover from the crowns, while annual weeds recover from buds along the stems, so that cutting new seedings of clover and alfalfa high merely favors the weeds and does not benefit the legumes. Sweetclover should never be cut, high or low.

Literature Cited

1. Boltz, G. E., Loss of Organic Matter in Green Manuring. *Monthly Bull. Ohio Agr. Exp. Station* 11: 347-350, 1916.

FIG. 8

July 21, 1945. Treatment 2. Stubble remaining after raking and removing the combined straw.

TAPPI Notes

Lambert Van Roy, formerly of the Central Paper Company, is now president of the Palisades Construction Company, Menasha, Wis.

David M. Shapleigh, formerly of Paper & Industrial Appliances, Inc., is now manager of Devon Products, Inc., Waverly Ave., Mamaroneck, N. Y.

Hubert J. Privette, formerly of the Sonoco Products Co., is now with the R. J. Reynolds Tobacco Co., Winston-Salem, N. C.

Thurston L. Yocum, formerly chemist for the Crown Zellerbach Company, is now with E. D. Jones & Sons, Inc., Pittsfield, Mass.

James L. Forsyth, formerly chief chemist of the Waxide Paper Company, is now with the International Paper Company, Niagara Falls, N. Y.

C. E. Geddes Thomson, formerly assistant technical director for Chas. Brunning Company, is now a consulting chemist, Box 253, Evanston, Ill.

L'association Technique de L'industrie Papetiere has been organized in France (Technical Association of the Paper Industry). Pierre Delcroix, Secretary-General, 154 Blvd. Haussman writes (to R. G. Macdonald, Secretary TAPPI) "The first letter of this Association is addressed to you to announce the organization of A.T.I.P. which is patterned after the Technical Association of the Pulp and Paper Industry in the United States. We intend to hold our first meeting in Paris in June 1947 and wish to extend an invitation to any of your members who may be in Europe at the time to be present. We admire the fine way in which your Association is organized and functions and we hope to promote fine friendship and cooperation between the two Associations."

New TAPPI Members

The Executive Committee of the Technical Association of the Pulp and Paper Industry has elected the following to membership.

Louis E. Anderson, Chemical Engineer, Armour Research Foundation, Chicago, Illinois, a 1941 graduate of the Armour Institute of Technology.

Francis P. Birk, Paper Mill Engineer, Birk & Choporis, Chicago, Illinois. He attended the Chicago Technical College.

Niels H. Bjerg, Assistant Plant Manager, A. B. Dick Co., Chicago, Illinois, a 1926 graduate of the Royal Polytechnical College, Copenhagen, Denmark.

Orland J. Blanchard, Supervisor, Byron Weston Company, Dalton, Massachusetts.

Harold V. Brady, Engineer, The Perkins-Goodwin Company, New York City, a 1938 graduate of the University of Texas and a 1947 graduate of Columbia University.

George E. Chamberlin, Student, Institute of Paper Chemistry, Appleton, Wisconsin, a 1942 graduate of Iowa State College.

John Cochran, Technical Service Engineer, Hercules Powder Co., Freeman, Ont., Canada, a 1940 graduate of Lehigh University.

Harry E. Gronich, Research Chemist, Allied Chemical & Dye Corp., Central Research Laboratory, Morristown, New Jersey, a 1941 graduate of New York University.

Marvin H. Dixon, Power Engineer, St. Regis Paper Co., New York City, a 1924 graduate of Northwestern University and a 1930 graduate of Massachusetts Institute of Technology.

Open Top Diffusers*

By Philip J. Hannan[1]

Abstract

A description and comparison of open top and closed diffusers are presented. The advantages and disadvantages are given.

Essentially, the only difference between open top and closed diffusers lies in the pressure differential between the water at the top of the pulp and the effluent at the bottom. In a conventional diffuser this differential is determined by available pump pressure, safe working pressure of the vessel, or by preferred practice; also to a small extent by the elevation of the discharge pipe. In the open top diffuser the only difference in pressure possible is the static head of water equal to the difference in level between the top and the discharge.

The decision to build open washers early in the history of the Hodge mill was motivated not especially to have this type of diffuser, but merely to have a separate washing system for a special purpose; namely, to wash hardwood. This short-fibered stock had a tendency to pack quite hard against the bottom plates in the tall pressure diffusers with a resulting very slow rate of washing, and the wide, shallow wash pans were a happy solution. After separate hardwood cooking was discontinued, the open top diffusers were kept in use with the regular diffusers, to increase the total washing capacity. In their present cycle of operations they receive exactly the same kind of pulp and size of charge as do all the other diffusers. The closed units have a diameter of 10 feet and are 20 feet high, while the open tanks are 19 feet in diameter by 14 feet high. It can readily be seen that a volume of pulp sufficient to fill the closed diffuser will in the open tank reach a height of only about 5½ feet. What this means in washing results, even with the greatly lowered pressure differential, is clear from Fig. 1; which shows Baumé of effluent plotted against washing time for each system.

System Operation

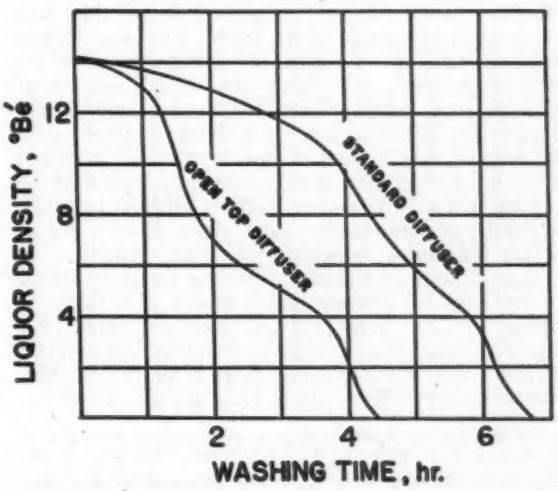
A study of the figure alone, with the wash pan curve descending sharply to zero, would seem to indicate that this method is to be preferred. The disadvantages, however, nullify to a large extent the shorter cycle. The most prevalent trouble is channeling. A tall, narrow cylinder ought to keep a liquid more uniformly seeping down through a mass of pulp than a large-diameter vessel, and this is actually the case. It does not appear possible to get a charge of stock packed into a wash pan with sufficiently equal resistance throughout to prevent the appearance of clear effluent through the bottom at one spot while another still shows black. It is undoubtedly because of this defect that, in spite of the more rapid washing rate, the average liquor to the evaporators is slightly weaker from the open top than from the closed diffusers.

A second disadvantage in the wash pans is the heavier stock loss into the effluent liquor. This is readily explainable from the large area of the perforated bottom. It is not entirely a loss, since the black liquor filter stock is sent back into the system, but is an added nuisance—and in the final clearing up period runs into an actual loss to the sewer. It might be mentioned here also that the larger diameter of the open pans adds about 15 minutes to the dumping time, which should properly be added to the washing time on the graph for a fair comparison.

The higher maintenance on bottoms in the open top diffusers is compensated for by the higher daily turnover possible with these washers.

Some observers have expressed surprise that open top diffusers wash down in so short a time, stating that the advantage of small height should be more than offset by the lack of water pressure at the top. A possible explanation might be in the fact that the slow downward velocity allows a condition which approaches a soaking period. Pulp washing is, at best, a very inefficient process. If it were necessary only to rinse the liquor off the surface of the fibers, like rinsing off steel wool, the problem would be simple. What actually must take place is slow diffusion and mixing of the water adjacent to the fiber with the liquor held within it, while the concentration of the external solution approaches but never reaches that within the fiber. When this diffusion has proceeded far enough, the pulp fiber can be declared clean. It requires a definite time element, a soaking out period, which is more probably present in the slowly-travelling phases of the shallow wash pans. This slow rate of travel is readily provable, even in the face of the shorter washing time, by basing calculations on the short distance from the top of the pulp charge to the bottom.

To sum up, in the open top diffusers the only apparent advantage is a shorter washing cycle. The chief disadvantage lies in channeling, with resulting "slick spots" in the pulp, and slightly weaker effluent. Until this trouble is successfully overcome the consensus of opinion among the plant operators is that the closed diffusers are to be preferred.



Washing Efficiency. Open Top vs Standard Diffusers

* Presented at the meeting of the Technical Association of the Pulp and Paper Industry held at the Hotel Roosevelt, New Orleans, La., Oct. 14-15, 1946.

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A Method for the Determination of Water Vapor Permeability at Low Temperatures*

By S. W. Pierce[1] and J. F. Helms[2]

A method has been sought primarily for the determination of the water vapor transfer of completed frozen food containers at conditions approximating those of storage. The literature contains few references to methods applicable to tests at low temperature on either sheet materials or complete packages. Carson *(1)*, in his compilation of thirty literature studies, lists one low temperature cup method; the work done by Tressler and Evers *(2)* in 1935. Further work on sheet materials, described by Dubois and Tressler *(3)*, is listed in the bibliography of the Institute of Paper Chemistry's Instrumentation Studies *(4)*. Further, from this same source, is the work carried out by Kaess *(5)*, involving the use of a gas current to transmit water vapor. More recently there has appeared a recommended standard test procedure for frozen foods packaging materials *(6)*.

The general method of using a cup with desiccant or water sealed beneath the sample is well suited to testing at high temperatures, and is adaptable as well, at similar conditions, to the testing of fiber containers. However, attempts to apply this direct approach in the determination of the water vapor transmission rates of containers at a temperature below 32°F. revealed grave difficulties. Removing the containers from test storage for the necessary periodic weighing operations, and exposing them to room temperature even briefly, resulted in serious error due to condensation of water on the surface. Particularly was this true of packages with metal ends. The intermediate step, sometimes recommended, of placing the cold samples in a desiccator until temperature equilibrium is established, was considered to have real objections. Conditioning in this manner is not only time consuming but it also introduces the possibility of error from changes in the moisture content of the package itself.

Consideration was given to the construction of a test cabinet in which the handling and weighing of samples could be carried out by remote control from the outside, but this was abandoned because of the obvious complexity of an apparatus of this type adapted to low temperature work. The most simple method, that of conducting all manipulations at the test temperature, was clearly impractical, because of the physical inconvenience to the operator. These limitations indicated that the desirable method would be one in which the test sample was not removed from low temperature storage during the course of the determination. The present indirect method, in which a dried gas removes the water vapor from a cell in which the sample is sealed, was then evolved.

Applications of a similar principle are to be found in the work of Thomas and Reboulet *(7)*, Wosnessensky and Dubnikow *(8)*, Lishmund and Siddle *(9)*, and Edwards *(10)*, on high temperature water vapor transmission determinations. More recently a method has been described by Davis *(11)* and suggested for the low temperature study of sheet materials.

The apparatus to be described was developed to provide a rapid water vapor transmission test method under conditions simulating the most adverse actual storage conditions. However, the arrangement and construction of the equipment are such that changes in temperature and humidity, to permit testing at less stringent conditions, can readily be made. A further advantage is the adaptability to testing either sheet material or completed containers.

Description of Apparatus

The apparatus (Figs. 1, 2, and 3) consists of an enclosed gas system, the larger part of which is inside an American Instrument Company constant temperature cabinet (Model No. 4-3352). The cabinet is divided into two compartments, a dry ice chamber as the refrigerant source connected by a blower to the test chamber. A bimetallic thermoregulator with a sensitivity of ±0.09°F. controls the blower, while a second fan operates continually in the base of the test compartment to promote circulation. The combination provides very accurate temperature control. The cabinet is also equipped with a heating coil, so that a range of temperatures from −100°F. to +220°F. is available for test purposes.

For the present work it was desirable to modify the test chamber section of the cabinet by substituting in place of the regular cover a false top made from two sheets of Celotex, separated by wooden slats about 3 inches thick. Through this cover the inlet and outlet tubes were led and its use made it unnecessary to alter any part of the equipment permanently. Although this top does not possess the insulating properties of the regular cover, it has been found suitable for work at 0°F.

The gas used as a medium to transport water vapor in this system is nitrogen, selected because of its chemical inertness, and because it is readily available with a low content of water vapor. It has been found to be entirely suitable for the purpose.

In the operation of the equipment, compressed nitrogen, controlled by a needle valve, is supplied to the apparatus at a constant rate, as shown by the flowmeter (B, Fig. 1). The gas passes through an oil block (C), which prevents back flow when the supply is shut off, to the first of two drying columns (D). This column contains calcium chloride and the second (E), contains Dehydrite (anhydrous mag-

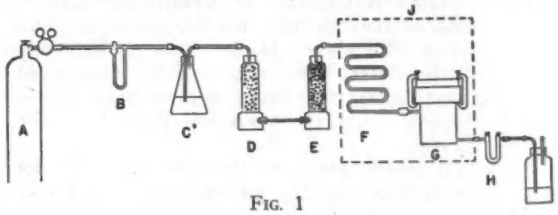

FIG. 1
Diagram of Apparatus
A. Compressed nitrogen cylinder; B. Flow meter; C. Gas flow check; D. Drying column—calcium chloride; E. Drying column—anhydrous magnesium perchlorate; F. Coil; G. Test cylinder; H. Gas absorption tubes; I. Back pressure bottle; J. Constant temperature area.

* Presented at the Annual Meeting of the Technical Association of the Pulp & Paper Industry, Hotel Commodore, New York, N. Y., Feb. 24-27, 1947.

[1] Chemical Engineer, Research Division, American Can Co., Maywood, Ill.
[2] Chemist, Research Division, American Can Co., Maywood, Ill.

nesium perchlorate). The dried nitrogen then enters the low temperature section inside the test cabinet and is led first through a coil of ¼-inch copper tubing (F), 27 feet in length, in which the gas is brought to test temperature. The exit end of the coil is brazed to the center of a horizontal manifold, consisting of a twenty inch section of ⅝-inch copper tubing sealed at either end. Six lengths of ¼-inch tubing are brazed at even intervals along the opposite side of the manifold and through these the gas stream is conducted to the six test cells.

The cells (Fig. 2) are formed from 11-gage steel tubing, with top and base made from disks of $\frac{3}{16}$-inch sheet steel brazed to the cylindrical sections. Each cell has an inside diameter of 5 inches and an inside height of 6 inches, dimensions which are adapted to the accommodation of typical frozen food packages. The cover rests on a rubber gasket in a groove concentric to the top of the cell and is held tightly in place with three C-clamps. The copper inlet tube brings gas into the cell at the top, just below the flanged section, and a similar tube conducts it away from an exit near the base, diametrically opposite. This arrangement promotes circulation and complete movement of the gas in the cylinder.

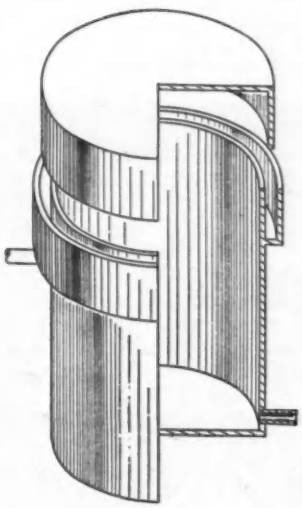

FIG. 2
Test Cylinder

The exit tubes from the test cells lead the gas to U-Tubes (H, Fig. 1), containing Dehydrite, outside of the low temperature chamber. On the exhaust side of each weighing tube is a gas bottle containing mineral oil, and a pinch clamp on the outlet. This combination is used to equalize the flow in the six separate streams and to maintain a slight constant pressure in the system. A gas flow of approximately 390 cc. of nitrogen per minute is introduced at the beginning of the system, and the six exhaust streams are periodically checked with a flowmeter to insure that division is uniform. The rate was calculated on the basis of a complete change of gas in each cylinder every 30 minutes, and though arbitrarily chosen, it has been found to be satisfactory.

All parts of the system contained in the low temperature cabinet are of metal and have brazed joints. The external system is of glass and the connections are made with short sections of heavy gum rubber. A fine wire thermocouple is used to obtain a constant check on temperature in the test cells.

FIG. 3
View of Apparatus

Procedure

TESTING COMPLETED CONTAINERS

The low-temperature cabinet is adjusted to operate at a temperature of 0°F. and the nitrogen flow at a rate of 390 cc./min. The containers to be tested are filled with water-saturated blotters or sponges, allowing headspace for expansion during freezing, and are then sealed and placed in the cylinders to be frozen. A period of 24 hours is allowed for the test containers to become frozen and to attain a constant rate of water vapor transfer. The weighing tubes are then placed in the gas circuit and the weight gains determined every 24 hours.

Since the weight increments are quite small for some containers, the U-tubes are weighed on a four-place analytical balance. The tubes are allowed to condition in the balance case for 30 minutes and the pressure equalized with the barometric pressure before each weighing. The weight determinations are continued until a plot of the grams gained against the time shows a straight line relationship. One hundred hours will usually suffice to complete a test. The rate of water vapor transmission can then be determined from the straight portion of the curve. At the conclusion of the test period each container is examined for structural failures or other faults which might contribute to a false test result.

TESTING SHEET MATERIALS

Although the method was developed for water vapor transmission studies of containers, it appears to be well suited to the testing of sheet materials. Water vapor transmission rates on flat stock samples of such component parts of frozen food containers as cellophane wrappers, aluminum foil, etc., can be determined by the use of test cups, filled with water saturated blotters or sponges. The method of cup preparation outlined in TAPPI Tentative Standard T 464 m-45 of the testing methods of the Technical Association of the Pulp and Paper Industry is suitable. However, because ordinary wax sealing mediums shrink noticeably at low temperatures, it was felt that a more secure seal was required for such tests. Determinations made with metal disks in place of test membranes in the cups, showed that petrolatum-U.S.P. was a satisfactory and efficient agent for this purpose. Tests on flat stock were conducted exactly as with containers and rates were determined at the completion of a 100-hour testing period.

TABLE I.—0° F. WATER VAPOR TRANSMISSION RATES FOR FROZEN FOODS CONTAINERS

Description of Container	Rate, grams/week/container
1. Composite can (paperboard body and metal ends); no protection to passage of water vapor	0.64–0.86
2. Composite can (ethylcellulose body and metal ends)	0.28
3. Composite can (paperboard body with outer ply of 0.001 aluminum foil and metal ends)	0.04
4. Same as No. 3, wax sprayed inside container	0.03
5. Same as No. 3, container wax-dipped	0.02
6. Folding box of waxed paperboard, inner bag of glassine, outer wrap of heat-sealed wax paper	0.02–0.03
7. All aluminum container, heat-sealing adhesive	0.02
8. Composite can (paperboard body and metal ends); body treated with modified paraffin wax	0.01–0.03

Results

Containers

Tests were made first on various types of containers to determine both the magnitude and the range of weight changes and the length of time necessary for different containers to attain steady states of water vapor transfer. In Table I are shown rates obtained for typical containers of various dimensions and constructions.

The water vapor transmission rate for a completed container is not only a measure of the water vapor permeability of the body wall material, but also is related to other characteristics of the package as a complete unit. It is affected significantly by variables introduced in manufacture, such as the completeness of closure, and the effect of bending and creasing on the constituent parts of the container during body formation. Due to the number of factors contributing to the rate, it is advantageous to consider the container as a whole; and express the gain in grams per week regardless of container dimensions. This is permissible, of course, only when dealing with packages of approximately equal content, such as the familiar consumer size, which is treated here.

Sheet Materials

Table II lists water vapor transmission rates for some of the materials frequently used in frozen food containers. These rates are expressed as the gain in grams per 100 square inches in 24 hours. From these rates an estimate can be made of the extent to which closure and body deformation contribute in the transmission rate of the whole package.

Although the comparative performance of these and other applicable sheet materials provide a wide field for investigation, they have necessarily formed a minor part of the work for which this apparatus has been used. However, the derivation of W. V. P. rates for flat stock samples has permitted observations to be made on the precision and reproducibility of this method, which are not possible in tests on complete containers. Repeated determinations on homogeneous sheet materials have indicated excellent reproducibility, justifying confidence in the results of tests on packages, where the incidental variation from sample to sample often results in a significant qualitative difference between containers which are nominally identical.

Application of Method

The method which has been described has proven to be well suited to the accurate measurement of water vapor permeability at low temperature for both sheet materials and containers. For purposes of comparison the rates obtained are valuable in judging the merits of containers of different types, as well as in evaluating experimental construction variables. However, it is obvious that these rates are never true measures of the actual transfer of water vapor taking place in packed commercial containers. The conditions to which a frozen food package may be exposed when in use are so diverse, both because of essential differences in products and variations in storage temperature and humidity, that no standardized test in itself could provide even an approximation of the real worth of the container. Actually, there is no such average value, as it is true in this case as of all substantially fibrous packages, that the degree of protection afforded is dependent on the nature of the product and the conditions of storage. Since this test, or any other, furnishes numerical rates which are reliable standards for comparison but meaningless when applied to performance, there is need for data which will make possible their proper interpretation.

Apparently there is a lack of accurate information on the exact degree of protection required by different frozen foods. Various reasons, including those cited above as responsible for the development of this method, make it impractical to determine these specific values directly. The necessary relationship could readily be established, however, by a series of tests, in which representative frozen food containers, whose water vapor permeability rates at 0°F. have been determined, are packed with products known to be severely affected by dehydration and stored at typical refrigerated conditions. Regular examinations conducted over a sufficiently extended storage period would then fix the life of each package for each product, and establish the desired correlation between performance and rate of water vapor transfer. More comprehensive testing would include products only moderately or slightly degraded by dehydration, as well as an investigation of storage at various conditions.

TABLE II.—0° F. WATER VAPOR TRANSMISSION RATES FOR SHEET MATERIALS

Material	Rate, grams/100 sq. in./24 hr.
1. 0.017 paperboard	0.907
2. 0.0018 waxed paper (creased)	0.317
3. 0.0018 waxed paper	0.042
4. Rubber hydrochloride film	0.016
5. 0.00035 aluminum foil	0.012
6. 0.017 paperboard, wax coated	0.004
7. 0.0009 moistureproof regenerated cellulose	0.003
8. 0.0007 aluminum foil	0.000

Such complete information would not only permit the correct usage to be made of present containers but would also aid in classifying new packages and eliminating unsatisfactory types from consideration. Once the relationship had been determined, containers could be graded precisely entirely on the basis of their water vapor permeability rates at 0°F.

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